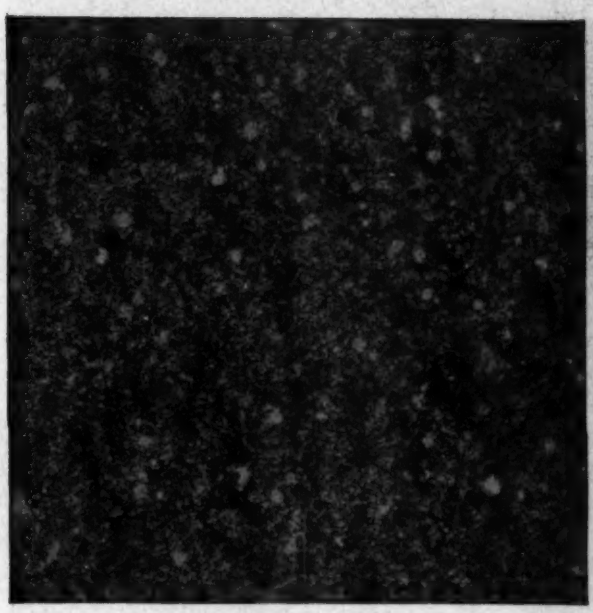
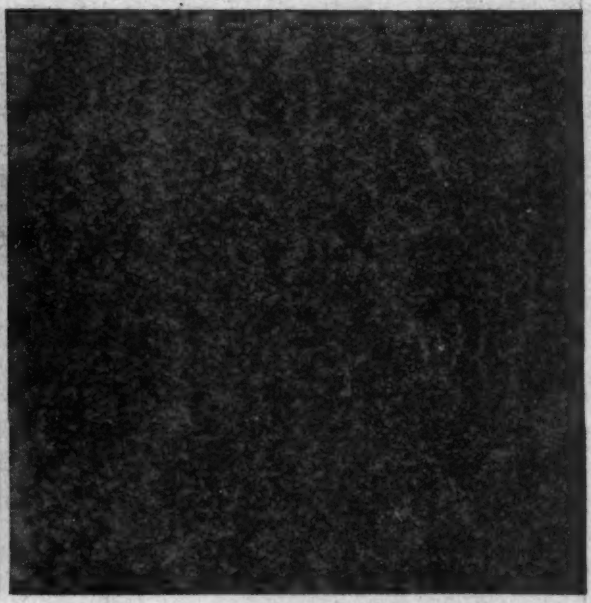
THIN SPOTS 75% ELIMINATED

Micro-Photographs Show That NOPCO-KF Makes for Better Sheet Formation



• *Micro-photograph of sheet (furnish 40% sulphite and 60% soda) prior to incorporation of NOPCO-KF. Note the extremely uneven transmission of light indicating poor sheet formation.*



• *Micro-photograph showing resultant sheet after NOPCO-KF was added to the fan pump of the paper machine (absolutely the only furnish change). Uniform formation is shown by even distribution of light and dark area.*

BY using NOPCO-KF at various stages of the pulp and paper manufacturing processes, leading paper and paper board mills are able both to improve quality and increase production. The reason — better fibre dispersion and foam control. NOPCO-KF — a super "bubble-buster" — practically eliminates obstinate foam in a few minutes. Even when operating at capacity, entrained air — the common cause of thin spots — is dissipated as if the stock were being handled at slower speeds. That's because NOPCO-KF keeps *"working" even on the wire.*

A "Specific" for Better Sheet Formation

Reduced breaks — improved surface characteristics — conservation of valuable paper-making material — increased water repellency — saving of pigment in heavily pigmented paper — these are additional reasons why NOPCO-KF — a chemical substance expressly formulated to aid sheet formation — assures more and uniformly finer paper even at increased machine speeds. See for yourself. Order enough for a trial run. Write, wire or phone.

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for Controlled Beating

Actual performance chart indicates ability of Jones-Bertrams Beater to operate on exact and controlled beating cycle thus reproducing stock characteristics batch after batch, day in and day out, and at any future time.

UNIFORM FIBRE TREATMENT

SHORT BEATING CYCLE

AUTOMATIC CONTROL

LOW H.P. PER TON

GEARED FOR WAR PRODUCTION

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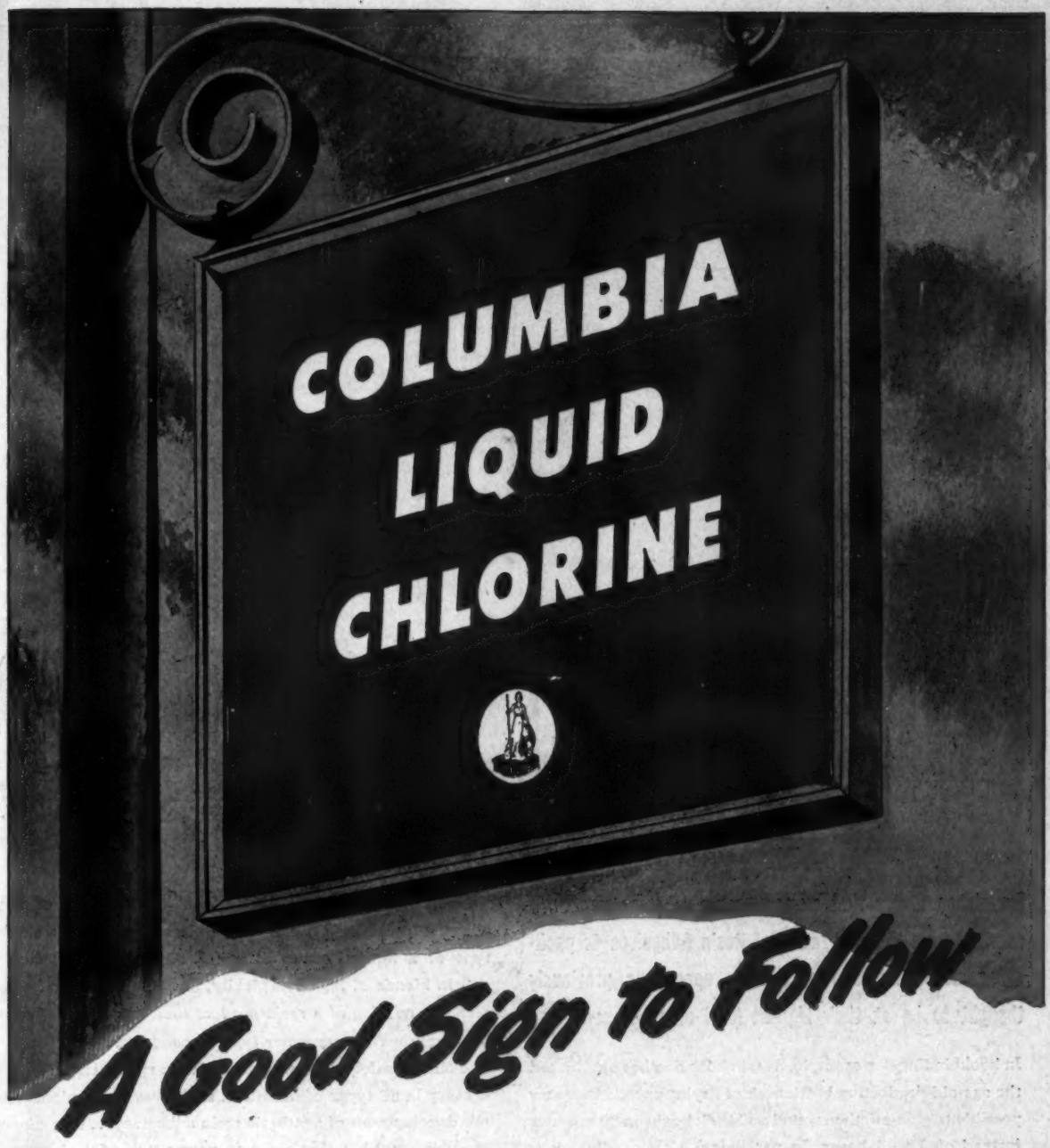
Builders of Quality Machinery for Paper Mills



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As military requirements relax, increasing quantities of Chlorine will become available for normal use. Columbia—always alert to serving its customers—can be relied upon as a superior source of this important basic chemical. Supplied in all types of equipment including the new 55-ton single unit tank cars.

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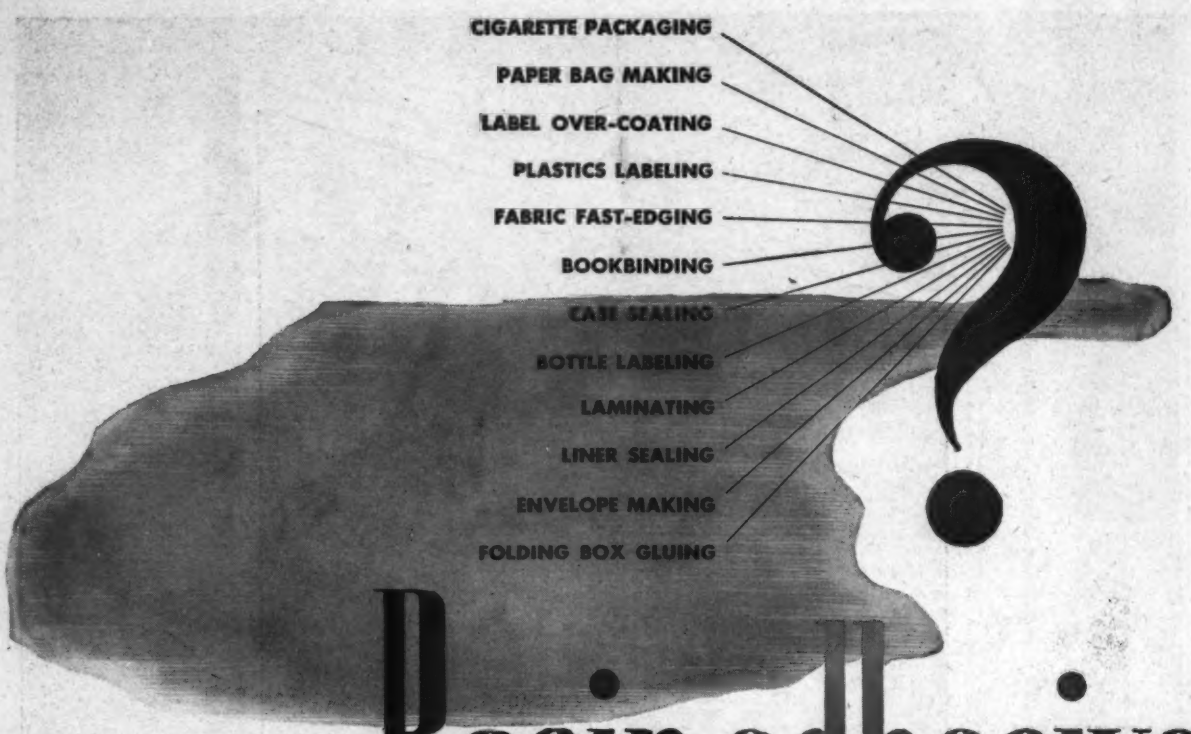

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In bookbinding, for example, a resin adhesive has eliminated the age-old production bottleneck of drying speed: It is now possible to glue-off, then round and back books in 20 minutes instead of 3 to 4 hours. In packaging, a resin adhesive is giving important new moisture protection to cigarettes. In specialty bag making, a resin adhesive makes it possible to safely ship coal, asphalt, fertilizer and many other products in less expensive, more convenient containers.

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The inevitable reaction, as war-time restrictions are lifted, will be a compelling demand for the things we've missed . . . and fine paper will be no exception.

Quality will be the watchword. Will you set the standards for OPACITY, BRIGHTNESS and WHITENESS that will satisfy a market hungry for the best?

Your plan to use TITANOX pigments in your post-war stocks is pointing you in the right direction.

TITANOX in paper means QUALITY paper! For TITANOX contributes unsurpassed opacity, whiteness and brightness, extreme resistance to after yellowing and, in tinted stocks, outstanding clarity of color . . . all with a minimum of pigment.

Plan now to use TITANOX pigments. They'll help you to keep out front in the race for post-war business.

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Vol. 121, No. 8

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

August 23, 1945

Sees Scarce Newsprint Supply for Months

Forest Products Bureau of WPB Expects No Increase In Print Paper For American Publishers Soon — About Forty Wartime Restrictions To Remain — Will Continue Waste Paper Salvaging.

WASHINGTON, D. C., August 20, 1945—Although all but about 40 War Production Board controls will be lifted immediately, the restricting orders on paper and newsprint will remain in effect for the time being, Chairman S. A. Krug of War Production Board said following the end of the war with Japan.

The paper situation generally will be substantially easier except for newsprint, he said. The outlook there will depend on the Canadian supply of pulp and possibly new supplies from Scandinavian sources, he added.

Wood rosin and other naval gum stores will remain tight, he said, necessitating continued controls on these products.

Newspaper publishers should not anticipate any immediate increase in their authorized use of newsprint in view of the continued shortage and lack of any definite assurance of increased supplies, the War Production Board announced today.

Benton R. Cancell, director of WPB's Forest Products Bureau, issued the following statement on the newsprint situation:

"The end of the war has caused considerable conjecture on the part of newspaper publishers with respect to increased supplies of newsprint. It is quite apparent that many publishers feel that additional supplies will be forthcoming immediately and that Limitation Order (L-240) will be relaxed accordingly.

No Increased Supply in Sight

"No increase in supplies of newsprint are in sight at the present time. Imports of pulp from Europe and cutbacks in military pulp and paper requirements affect the supply of newsprint to a minor extent only. In fact, none of the pulp imported from Europe can be used in the production of newsprint because it is too costly and because newsprint mills in North America are not physically equipped to handle this material.

"In accordance with general WPB policy, the Forest Products Bureau will continue to emphasize the necessity for increased production of newsprint, both in this country and in Canada. The pulpwood cutting cycle in the northeast and in Canada is such, however, that wood cut now would not become available until the spring of 1946.

It is unfortunate that newsprint production in northern Europe is so far below the pre-war level that none can be made available to the United States. This situation will probably not be corrected until the European coal problem is solved, which may not be before the latter part of 1946 so far as the European pulp and paper industry is concerned.

"An additional factor in the tight newsprint supply situation is the discontinuance of newsprint production in a few of the smaller domestic newsprint mills."

The Newspaper Publishers Industry Advisory Committee will meet in Washington on September 11-12, 1945 at which time WPB officials will discuss the entire matter with them, and future plans for newsprint production and distribution will be formulated.

Regarding the future of paper restrictions, the War Production Board has stated:

"Certain exceptional items must be kept under distribution controls for a limited period of time despite the general presumption against such controls. In the case of newsprint, there is a special public interest in equitable distribution pending the availability of Scandinavian, Canadian and domestic supplies in normal quantity.

"It is a matter of paramount concern that smaller newspapers are not forced out of existence during a period of scarcity directly resulting from war conditions. On the other hand, continuation of the newsprint limitation for too long a period would have the disadvantage of unnecessarily limiting new competition. As soon as newsprint supplies approach normal levels, therefore, the control will be revoked."

Continue Pulp, Waste Paper Drives

The war's end in no way eases the tight paper situation, Frank Block, director of the War Activities Committee of the Pulpwood Consuming Industries and the Conservation Committee of the Waste Paper Consuming Industries, said today. "Both the U. S. Victory pulpwood and the U. S. Victory waste paper campaigns are continuing operations, at least for the present," Block stated.

Seriousness of the paper supply situation was demonstrated the morning after President Truman's Victory declaration when the Waste Paper Industry Advisory Committee convened at an emergency session in Washington. Paper can very well become the chief bottleneck to orderly reconversion, the committee was told bluntly by Benton R. Cancell, chief of the Forest Products Bureau of the War Produc-

(Continued on page 26)

Montreal Expects Better Newsprint Supply

Canadian Production May Possibly Be Increased In Fourth Quarter But Pulpwood Is Limiting Factor — More Equipment and Labor Available — Reconversion Proceeds Rapidly — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., August 20, 1945—The sudden end of the war with Japan has materially improved both the immediate and the long-term outlook in the newsprint industry here. Interest is now centered on the possibility of a modest increase in the fourth quarter of the present year over the present shipment of 220,000 tons of newsprint per month to the United States. Arrangements are being made for a meeting in September to decide this question, to be held either in Montreal or Washington, between representatives of the Canadian Wartime Prices and Trade Board and the United States War Production Board. Whether or not such an increase can be effected will depend on a number of factors yet to be determined. The primary factor definitely limiting total production to around the present scale is the size of the present stockpiles of pulpwood now at the mills. These cannot be supplemented until the forthcoming season's cut is available early next summer.

Offsetting this restriction is the possibility that military needs for both pulp and paper may show a reduction in the immediate future and that progressively larger supplies of Scandinavian pulp and paper may now become available for overseas markets which have been relying on Canadian supplies. An easement in the shipping situation is expected to make this possible, though reports as to present production facilities in Scandinavian countries are not very optimistic.

Another factor is that Pacific countries, and in particular Australia, will likely be pressing for additional supplies as more shipping becomes available. They have for a long time past been carrying on with the barest minimum.

More Equipment and Labor Available

Looking further ahead, the outlook is distinctly brighter. Both in the matter of equipment and of labor, fundamental difficulties with which the industry has been struggling for years are in process of solution. The Government is moving rapidly in the easing of controls which have been hampering this industry in common with others.

The regulation freezing workers in their jobs unless they have government permission to switch occupations are being lifted and after September 3 employers will be permitted to advertise freely for workers. Due to the wholesale cutbacks in war industries many thousands of war workers are being displaced and from these, as well as from the ranks of the many thousands of service men now returning to civil life, it is expected that the industry will be able to recruit the many additional workers it needs.

This applies especially to the woods operations in the coming fall and winter, and also opens up the possibility of a resumption of summer cutting, by which stocks of pulpwood can be built up in the woods, to add to the regular season's cutting for floating down the rivers next spring.

A limiting factor in the last-named possibility is the protection afforded agriculture during this year's harvest period. Many of the workers in the woods are farmers, and the Government has provided that men on farms will not be allowed to leave that employment until after this year's crop is harvested—a provision that is not likely to be abolished until November 15.

Reconversion Proceeding Rapidly

In the matter of automotive equipment considerable change for the better is effective immediately. The rationing of gasoline has already been entirely removed, and the Government has announced the removal of all controls on the production of new automobiles and trucks, though the distribution of both will remain restricted to essential users. Manufacturers previously were authorized to produce up to 10,000 passenger cars and 12,600 trucks by the end of this year. The first new trucks and cars are expected to start rolling from the plants in October. It is added that there are now no restrictions on the importation of automobiles or trucks from the United States, though it is doubtful if U. S. manufacturers can spare many for some time.

Confidence is expressed by the Government that steel, nickel and other metals and materials for the manufacture of automobiles and other machinery and equipment will become more readily available now that the war is ended. This latter statement has especial significance for the industry. In view of the wholesale reconversion of engineering and metal-working plants, now proceeding at a rapid pace, it augurs an immediate speeding up of construction and equipment of various new pulp, board and specialty mills on which a start has been made, and paves the way for a start on the extensive projects for expansion, modernization and renovation of existing mills which have long been awaiting the green light.

Waste Paper Still Badly Needed

The end of the war with Japan does not sound the end of waste paper collecting, and every scrap of it will be needed by paper mills for some time to come, according to National Salvage Campaign authorities. They say they have been informed by the Government that waste paper will be needed for a long time to come and have guaranteed through the paper mills to take every pound of waste paper until January 1, 1946. This date will probably be extended in the near future. As one example among many of the general need of wastepaper for manufacturing package board, word now comes from the Prairies that paper box manufacturers there are critically short of materials for the making of egg fillers, now that fresh eggs are being exported in place of powdered eggs.

Gaspesia Sulphite Company

Gaspesia Sulphite Company Limited are installing a fifth digester in their mill at Chandler, Que., and expect to have the work completed by the end of this year. The new digester will eliminate an unbalance in digester capacity as compared with the equipment capacity in the rest of the mill, and will cause an increase of 25% in wood requirements.

IN THERE PITCHING

Every Minute the Press Felt Operates

It's impossible to overestimate the contribution to production that has been made by the hundreds of Vickery Felt Conditioners that have been quietly and steadily on the job throughout the emergency period.

Felts are kept continuously clean and open right through every week. Maximum water removal is effected at the presses instead of at the dryers where it takes longer and is infinitely more costly.

Just because they're tucked away out of sight don't overlook your Conditioners and the importance of the job they're doing. Check with Bird Machine Company, South Walpole, Massachusetts, for information on installation, operation or maintenance of

VICKERY FELT CONDITIONERS

Chicago Expects Paper to Continue Scarce

Big Backlogs and Low Inventories Combine To Keep Civilian Supply Relatively Tight For Some Months — OPA Meets With Pulp Producers—Salesmen Hold Last Golf Outing—Other Market News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., August 20, 1945—There was little business activity in Chicago paper circles this week. The rumors of Tuesday, followed by the holidays on Wednesday and Thursday found most offices and personnel quite willing to hold off on their own problems until next week in order to concentrate on Victory.

A telephone survey indicated that many jobber and sales offices were either closed or run on a skeleton basis on Thursday, as well as Wednesday, as Chicago tried to dig itself out of the welter of rumors and interpretations which followed President Truman's announcement of a two day Government employee holiday.

Most paper executives in this area do not expect the cessation of hostilities to immediately improve the paper situation. The backlog of demand, and the almost complete elimination of inventories would combine, in their opinion, to keep civilian goods items scarce for a long time to come. Military use of papers will also not subside for many, many months yet and the manpower problem will remain a critical one for some time.

Even so, the paper industry here expects to share in the immediate efforts to speed up production along all lines, in the expected amendment of income tax laws and in the steady lightening of controls—controls which may come near the last for paper because of its critical supply position.

Chicago's loop looked as though the waste paper salvage program were a thing of the past when the Victory celebration really got under way. Even so, the Mayor of Chicago, according to printed reports, plans to continue the over-all collecting programs until August 25.

Waste Campaign To End

Chicago newspapers reported this week that Mayor Kelly was asking all paper salvage campaigns to continue until August 25 when, it is expected, they will be trimmed down and ultimately abandoned. When the final termination date does come the waste paper industry in and around Chicago will have made a most signal contribution to the War effort, with its long series of nationally recognized salvage programs which went a long way to keep the mills in this area stocked with raw materials.

OPA Meets With Pulp Producers

The Office of Price Administration held important meetings with the pulp manufacturers of this section, and reportedly with pulp consumers, in Chicago during the first three days of this week. Convening at the Morrison Hotel on August 13, members of the industry met behind closed doors. Present, according to reports from the regional OPA offices, were John Bancker and J. V. Martin, representing the pulpwood branch of the paper and pulp section of OPA and Carl Diskin, attorney for the OPA. While no direct information has been released, it is understood from material supplied by reliable sources that the main topic of discussion was as yet unannounced increases in the price of hemlock logs with the purpose of the meeting to determine the effect of such increases on pulpwood production. It was also reported that attendance at the meeting would be expanded to include consumers of the pulp in order that a clear picture could be developed of the effect of the price not only on production but in the cost of goods fabricated by consumers of raw materials. Information also was to the effect that those present at the Chicago meeting included only executives affiliated with the various advisory groups affected and who operated in Michigan, Wisconsin and surrounding territory.

Salesmen Hold Final Outing

The western division of the Salesmens Association of the Paper Industry concluded its shortened series of golf outings on August 8 when fifty salesmen and guests enjoyed the facilities of the Olympia Fields Country Club. Scores ranged from the eighty-three which won low gross honors for Gene Hommes of Graham Paper Company to the one hundred and twenty-seven (127) strokes which congenial Phil Howard of the American Paper Merchant took to get to the nineteenth hole!

Other prize winners in the day's program which included time out for informal lunch and dinner were as follows:

Low net, Arch Hepburn, Tomahawk Kraft Paper Company; second low net, Arthur Brown, Nekoosa-Edwards Paper Company; third low net, Bert Lewis, Nicolet Paper Company; fourth low net, Duke Fortney, guest and fifth low net, William Havellar, Chicago Paper Company. Jim's records also show the low putt honors going to F. X. Brucker, Hartford City Paper Company and high putt prizes won by Allen Muller, guest. George Black of Bradner Smith & Company won the prize for the lowest score on number nine hole with Eddie Edwards of Howard Paper Company shooting the highest score on the same hole. Low putts foursome was composed of Harold Leahy, Duke Fortney, Gene Clifford and Paul Wesco while high gross foursome honors went to a threesome composed of Messrs. Bishop, Tucker and Edwards. Door prizes went to J. C. Olson and to the redoubtable Jim Coy who cashed in despite his admitted lack of golfing prowess.

Bryan Talks To Sapeyes

The western division of the Salesmens Association of the Paper Industry held an unusually interesting "open session" on Monday noon, August 13 at the Hotel Sherman with J. E. Bryan, general traffic manager of the Wisconsin Paper and Pulp Manufacturers Traffic Association, as the speaker. Mr. Bryan is one of the most widely known authorities on traffic problems in the United States. He gave a most graphic discussion of the freight rates and classification problems confronting the industry today. The part played by the shipping loads in the current shortages of paper was also outlined and members of the SAPEYES came away from the session with a great deal more appreciation for the job Mr. Bryan and his group is doing and with a better understanding of the direct relationship of transportation to their own selling jobs.

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TRENTON, NEW JERSEY

Many Mills Need More Post-War Workers

Wisconsin Paper Plants Generally Expect Slightly Expanded Production and Addition of More Employees In Future — Outlook Encouraging—Kimberly-Clark Has Safety Record—Other News.

APPLETON, Wis., Aug. 19—Wisconsin paper and allied industries, already in the process of reconversion, will provide employment not only for present workers and their returning servicemen, but in many cases will need additional men, newspaper surveys indicated last week. Almost without exception, the resumption of peace time production is having little or no effect on mill operations.

John E. Alexander, president and general manager of the Nekoosa-Edwards Paper company, Nekoosa and Port Edwards, Wis., announced last week that operations at the Port Edwards and Nekoosa mills would continue as usual, that no layoffs are contemplated and that more employes will be needed upon completion of an expansion project already begun.

At Rothschild, Wis., headquarters for Marathon Corporation, it was stated that the firm has had no cancellations, that it anticipated increased postwar business and was awaiting return of its hundreds of employes from war service to their former jobs.

At Wisconsin Rapids, Stanton W. Mead, vice president and director of manufacture for Consolidated Water Power and Paper Company, stated there would be no change in operations as far as the firm's paper and pulp mills were concerned but that there had been a slow-down on one of the plastics division's government contracts. It is too early to say exactly what will develop there, he said.

At Neenah, Kimberly-Clark corporation was informed that its ordnance contract for the manufacture of point detonating fuses had been terminated but Cola G. Parker, president of the corporation, announced that K-C would be able to give employment in its other mills to all employes of the Kimlark ordnance plant who wished it. Cancellation of the orders will have no effect on the company's operations, It was stated.

Kimberly-Clark corporation received the fuse contract in January of this year, began production in March and reached maximum production rate in May, constituting a production record unsurpassed in the United States. As a result, Kimlark plant employes were awarded a second star to be added to the Army-Navy "E" flag.

Outlook Considered Encouraging

At Appleton, the outlook was equally encouraging. Appleton Machine company reported that several small cancellations and cutbacks would have no effect on operations and that the firm was ready to resume its manufacture of paper mill machinery for which it has a big backlog of orders. Valley Iron Works, Appleton, officials said that the firm was well cleaned up on war orders before the surrender of Japan and that a considerable number of new employes are needed to produce a heavy backlog of peacetime orders.

Appleton Coated Paper company reported that its backlog of civilian orders is so large that any government cancellations will have no appreciable effect and a substantial number of additional employes is needed.

Other plants presented much the same picture. Tuttle Press company of Appleton still has many war orders but has been informed that the demand for its products will increase rather than decrease because of the needs of the army and navy during reconversion. More employes are needed and it still is impossible to meet civilian demands for the company's products.

About 50 more men are needed at Riverside Paper corporation of Appleton where no cutbacks have been received and none expected. The company has a very large number of orders.

Fox River Paper corporation of Appleton announced that its percentage of war orders was so small that if cancellations are received they will have no effect on the business. Civilian orders are so heavy, it was stated, that there will be no curtailment of employment.

K-C Reports Safety Record

Aiming at breaking a 488-day record, the materials department of Kimberly-Clark Corporation, Badger-Globe mill, at Neenah, Wis., last week reported a record of 375 days without a lost time accident. Employing 95 men and 17 women, the department includes the raw materials handling, finishing supply, shipping, warehouse and cleanup and janitors sections headed respectively by Glen Smith, Harry Nelson, Sylvester Stengel, Dick Kwicky and Bob Rodgers. E. J. Glomstead is safety director for the department.

The department's safety record was commended by Leo Madison, superintendent, and Ed Miller, foreman. In addition, Ralph Kehl, Badger-Globe manager, received a commendation from John C. Simonich of the industrial relations department for the safety record of the whole mill. It follows:

"A recapitulation of the National Safety Council contest ending June 30 reveals that there was a substantial improvement in accident experience at the Barger-Globe mill. There was a reduction in frequency from 16.35 to 12.23 and a reduction in the number of accidents from 24 to 18. It is gratifying to note that only three lost-time accidents occurred during the last seven months. Every employe at the Badger-Globe mill, together with your supervisors, your union-management safety committee, and your safety man, are to be complimented on this excellent record."

Join Bergstrom Paper Co.

Arthur Hedlund, formerly of Arthur Anderson and Company, Milwaukee, Wis., accountants, has joined the staff of the Bergstrom Paper Company, Neenah, Wis. The Milwaukee firm for many years has handled the accounting and auditing for Bergstrom.

Mr. Hedlund is in charge of all matters of a financial nature, including auditing, accounting, taxation, costs, and bookkeeping. In general, he serves as company controller. Mr. and Mrs. Hedlund and their two children have moved to Neenah.

Canada Sees No Sudden Change in Supply

Canadian Stockpiles of Pulpwood Reported Only Adequate For Current Operations During Balance of This Year—Releases New Abitibi Plan — Minnesota-Ontario Co. Taking Care of Veterans.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 20, 1945—While the surrender of our last enemy brightens the newsprint picture, in the opinion of the industry here, there is not likely to be any very great immediate change in the general paper supply situation. The end of the war with Japan is likely to see a moderate increase in the supply of newsprint for United States consumers in the fourth quarter of this year, but no one can see any possibility of any greater change this year.

The 20,000 tons a month boost given U. S. shipments for the third quarter of this year, following the capitulation of Germany, was due to the release of Scandinavian pulp for the European markets, and cannot be repeated with the fall of Japan. It is generally believed that stockpiles of pulpwood at the mills are sufficient only for current operations and will have to do until next May or June when next winter's cut is available. It is understood here that Scandinavian pulp and paper is not moving into the European markets in the volume first expected, due to a shortage of fuel. With coal mining so badly disrupted by the war, wood must be substituted in most of Europe. Naturally, the needs of the people for heat come ahead of paper requirements.

Canadian pulp and paper interests look with confidence to the future and see a steadily increasing activity, now that the wars are over. Many more men will be available for woods operations next winter with a consequent increase in the pulpwood cut, and it is possible that summer cutting will be resumed next year. It is believed that even with maximum production, it will be several years before the world shortage in pulp and paper can be met.

Releases Abitibi Plan

Release of the reorganization plan of Abitibi Power and Paper Company this week reveals that provision is made for a possible distribution, representing 1½ years' interest, to bondholders in this calendar year, if it appears unlikely that the plan will be consummated by December 1, 1945.

Notices to shareholders and unsecured creditors are being released and published calling meetings of the common shareholders on October 4, of the 6% preferred on Oct. 5, of the 7% preferred on Oct. 8, and of the unsecured creditors on October 10, 1945. All the meetings to be held at the Royal York Hotel, Toronto, Ont., and each will give consideration to the reorganization plan as recommended by the committee appointed by Premier Drew and which has the complete approval of R. S. McPherson, the liquidator.

The plan has been approved by committees representing the unsecured creditors and the several classes of shareholders and the Bondholders Protective Committee has announced that if the plan is agreed to by the unsecured creditors and the several classes of shareholders, it will recommend acceptance to the bondholders.

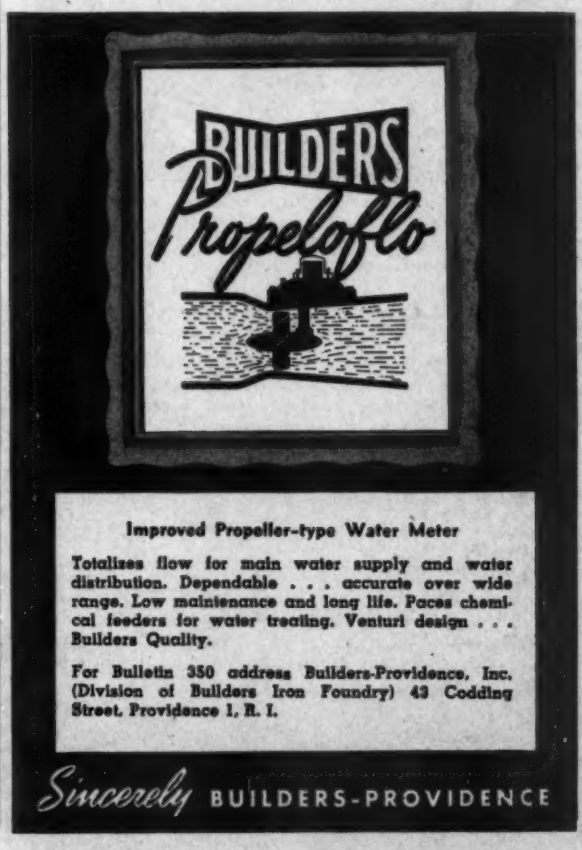
However, before the plan can become effective, it must be agreed to by holders of three-fourths of the shares of each class of shareholders and by a majority in number representing three-fourths of the value of the claims of the unsecured creditors present at a meeting of the unsecured creditors.

Meetings of bondholders will not be called until after the plan has been agreed to by all the other interests. How much time notice of the bondholders' meeting will be required is not known, but it is pointed out that at least 45 days' notice was given for the above meetings and that the Abitibi trust deed mentions 60 days' notice. This makes it appear likely that it will be early in 1946 before the new securities can be issued if the reorganization plan is approved.

Taking Good Care of Veterans

Canadian war veterans returning to the plants and offices of Ontario-Minnesota Pulp and Paper Company will be allowed leaves of absence for education or retraining and civilian readjustment, vacation allowances, reinstatement in former postions by company seniority and immediate reinstatement of all group life and hospitalization benefits.

Provisions for returning handicapped veterans call for medical examinations at company expense and placement in any available position which the veteran can satisfactorily fill when he is unable to perform the duties of the position to which he is legally entitled.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Obituary

George K. Hooper

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., August 20, 1945—George K. Hooper, president of Hooper Paper and Twine Company, and a former president of the Philadelphia Paper and Cordage Association, passed away at the University Hospital on Wednesday last after a brief illness. Mr. Hooper was stricken at his seashore home in Avalon, N. J., some five weeks ago and was rushed to Philadelphia, where despite the day and night attendance of physicians and consulting experts, death ensued.

During his incumbency as president of the Cordage association, for three consecutive years, Mr. Hooper was unremitting in his zeal for association affairs, serving day and night disregarding his own personal interest.

Mr. Hooper was a descendant of William E. Hooper, one of the signers of the Declaration of

GEORGE K. HOOPER

Independence, and a great grandson of William E. Hooper, founder of the Hooper Mills, Baltimore; he was a member of the Board of Managers of the Philadelphia Paper Trade Association, and was active in the affairs of Old Christ Church.

Surviving him are his wife, Edith Eyre Forrest Hooper, a daughter, Sarah Pedrick Hooper, his mother, Mrs. Marie T. Hooper and sister, Mrs. Marie Scott, both the latter of Baltimore.

George Abraham Bogle

TAMA, Iowa, August 12, 1945—George Abraham Bogle died in an automobile accident at Vincennes, Indiana. He was 50 years old.

On July 1st of this year the deceased was made general superintendent of all the mills of Central Fibre Products, with which he had been affiliated since 1926.

During the years when he was general manager of the local plant he came to be a trusted councellor and friend of the men who worked under him. He was a capable civic leader in our community having served on the city council for a period of six years.

Mr. Bogle resided in this city, where the funeral service was held, with burial at Ottawa, Illinois.

Paul D. Poinier

BOSTON, August 20, 1945—Paul Davenport Poinier, 69, president-treasurer of the Poinier-Carmer Company, mill representatives at 683 Atlantic avenue, Boston, died suddenly Thursday evening at his home, 20 Lime street. Mr. Poinier had not been in good health for the last few years, but had been able to come to his office about twice a week for a considerable period.

Mr. Poinier came to Boston in 1909 and became associated with the Eastern Paper Company, mill representatives. He was treasurer of that company at the same time that Fritz V. Carmer was vice president. In 1920, Mr. Poinier and Mr. Carmer formed the Poinier-Carmer Company with Mr. Carmer as vice-president, and have continued ever since in the same building in Dewey Square. He was a member of the Church of the Epiphany and of Parkman Lodge, A. F. and A. M., Winchester, and formerly of the Winchester Country Club and the Eastern Yacht Club.

His wife, Mrs. Marie Harlow Poinier, two daughters, Mrs. Richardson Harwood, Natick, Mass., and Mrs. Edward F. Bland, wife of Lieutenant-Colonel Bland, of Chestnut Hill, Mass., and three grandchildren are living. Funeral services, which were private, were held at the Waterman Chapel, Boston, and cremation and burial at Forest Hills Cemetery.

Pacific Mills Sets Up Retirement Plan

VANCOUVER, B. C., August 13, 1945—Arrangements have now been completed by Pacific Mills, Limited for a retirement income plan for all permanent employees. The new plan will go into effect on September first, according to Paul E. Cooper, President of the Company.

Speaking at a recent dinner meeting attended by key employees of the Company and their wives, Mr. Cooper outlined the details of the retirement plan, which will embrace not only all permanent employees of Pacific Mills Limited but also permanent employees of subsidiary companies, Canadian Boxes Limited, Vancouver, and the Hudson Paper Company Limited, Winnipeg.

The employee invests three percent of his annual pay and the Company subscribes an amount equal to four percent of his annual pay. Any employee leaving the Company or becoming deceased prior to retirement age, he or his heirs will receive all monies placed by him in the fund, plus interest.

Tompkins Heads Paperboard Sales

The appointment of States D. Tompkins as manager of the Carton Department of the United Paperboard Company has been announced by Harold W. Kephart, vice-president in charge of sales. For ten years production manager of the Foil Carton Division of Reynolds Metals Co., and previous to that production manager of the Shuttleworth Carton Co., Mr. Tompkins has had 23 years' experience in the folding box and carton industry.

Mr. Tompkins' long association with the industry goes back to his early childhood. His father, the late States D. Tompkins, Sr., was founder and partner of Miller-Tompkins and Co., manufacturers of paper bags and paper sacks.

He will make his headquarters at the United Paperboard general offices, 285 Madison Avenue, New York.

TODAY

It's time to re-Cooper-ate

THE ONLY ALLOY FOUNDRY WITH ALL THESE FACILITIES

- Laboratory control over raw materials and finished products.
- Dual foundry . . . both hand and machine molding.
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- Centrifugally-cast castings.
- Heat treating of Castings up to six feet.
- X-ray and Gamma-ray inspection. Precision Castings.
- Zyglo detection of surface imperfections.
- Precision Castings.
- Machine shop . . . specially equipped for finishing stainless steel.
- Improved cleaning . . . including Lustrecast electrolytic finishing which leaves all surfaces bright.
- Castings furnished rough, polished or fully machined . . . one ounce to two tons.
- Development of special alloys to meet unusual requirements.
- Technical consulting service.

The rigorous, incessant demands of war have taxed industrial machinery and equipment to the utmost—so wherever parts need replacement—stainless steel castings, valves, fittings, etc. —it's time to re-COOPER-ate! For Cooper can meet your replacement needs promptly and effectively with stainless castings designed to give maximum service under the hardest conditions . . . write for information.

The Largest Exclusive Stainless Steel Foundry in the Country

THE COOPER ALLOY FOUNDRY CO.
145 Bloy St., Hillside, New Jersey

THE ALLOY FOUNDRY CO.
STAINLESS • MONEL • NICKEL

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending August 18, 1945

STOCKS

	High	Low	Last
A. P. W.	5⅞	5½	5⅞
Armstrong Cork Co.	49	45¾	48½
Celotex Corp.	17⅜	16¾	17
Celotex Corp., pf.	20¾	20½	20¾
Certain-Teed Products Corp.	12¼	10¾	12
Certain-Teed Products Corp., pf.	164½	163½	163½
Champion Paper & Fibre Co.	34¼	33¾	34
Champion Paper & Fibre Co., pf.	....	....	....
Congoleum Nairn Co.	30⅜	29¼	29¾
Container Corp. of America	29	27¾	28⅞
Continental-Diamond Fibre Co.	12¾	12	12½
Crown-Zellerbach Co.	23	22	22⅜
Crown-Zellerbach Co., pf.	103¼	102¾	102¾
Dixie Cup Co.	27¾	26¾	26¾
Dixie Cup Co.—A	47	47	47
Flintkote Co.	30½	28¾	29½
Flintkote Co., pf.	109	108	109
Robert Gair	6⅜	6⅛	6⅛
Robert Gair, pf.	18	17⅝	17⅞
International Paper Co.	28¾	27	27⅜
International Paper Co. pf.	97¾	97¼	97¾
Johns-Manville Corp.	125	122½	125
Johns-Manville Corp., pf.	....	....	....
Kimberly-Clark Corp.	48¼	47⅜	47⅞
MacAndrews & Forbes	....	....	....
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	43	41¾	42¾
Mead Corp.	16⅞	15⅝	16⅝
Mead Corp., pf. A—6%	....	....	....
Mead Corp., pf. B—5%	....	....	....
National Container Corp.	15¼	14¼	14½
Paraffine Companies, Inc.	70	70	70
Paraffine Companies, Inc., pf.	109½	109½	109½
Rayonier, Inc.	20¼	19½	19½
Rayonier, Inc., pf.	37	36½	37
Ruberoid Co.	38	36¾	38
Scott Paper Co.	52¾	52¾	52¾
Scott Paper Co., pf.	111	111	111
Sutherland Paper Co.	35	35	35
Union Bag & Paper Corp.	18	16⅞	17⅛
United Paperboard Co.	6⅞	6⅝	6⅞
U. S. Gypsum Co.	93½	91½	92½
U. S. Gypsum Co., pf.	190¼	190¼	190¼
West Virginia Pulp & Paper Co.	29¾	28¾	28¾
West Virginia Pulp & Paper Co., pf.	....	....	....

BONDS

Abitibi Pulp & Paper Co. 5s '53	....	....	....
Celotex Corp. 3¾s '55	103	103	103
Certain-Teed Products Corp. 5½s '48	....	....	....
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	108⅝	108⅝	108⅝
International Paper Co. 5s '47	104¼	104⅛	104⅛
Mead Corp. 3½s '53	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending August 18, 1945

STOCKS

	High	Low	Last
Great Northern Paper Co.	38½	38	38
Hummel-Ross Fibre Corp.	8⅜	8½	8⅜
St. Regis Paper Co.	7	6⅞	7
St. Regis Paper Co., pf.	....	....	....
Taggart Corp.	....	....	....

BONDS

American Writing Paper Co. 6s '61	....	....	....

Rayonier Declares $2 Dividend

Stockholders of Rayonier, Incorporated, at their annual meeting re-elected all directors who subsequently re-elected all present officers. W. S. Lucey, a director of the company and former manager of the Grays Harbor Division, was elected a vice-president. The directors declared the regular quarterly dividend of 50c per share on the $2 dividend cumulative preferred stock, payable October 1st to stockholders of record September 14th.

International Nets $1.15

The International Paper Company and its subsidiaries reported, August 17, in a statement of operations covering the six months ended on June 30, a net profit of $4,411,071, equal to $1.15 a share of common stock.

For the corresponding period of last year, the company showed a profit of $3,941,273 or 89 cents a share after all charges.

Puget Sound Net Off for Six Months

BELLINGHAM, Wash., August 17, 1945 — Puget Sound Pulp & Timber Co. reports a net profit of $211,413 from operations in the first six months of 1945 after providing $280,244 for Federal taxes. This result compares with $243,322 net profit after $330,406 for taxes in the first half of 1944. Net income for the first six months, including net gain derived from the first two instalment payments on sale of Canadian timber properties, after tax provisions amounted to $370,869 for the 1945 period and $718,751 for the comparable period of 1944.

After payment of preferred dividends, operating profit was equal to 54 cents a common share for the first half of 1945, which compares with 64 cents a share for the like period of 1944. Including nonrecurring net capital gain, net income for the first six months of 1945 amounted to $1.13 a common share, compared with $2.20 for the first half of 1944.

Pulp production continued to reflect log shortage in the Pacific Northwest, which in turn is due to the shortage of woods labor. Production for the first half of 1945 amounted to 45,840 tons, against 53,454 tons in the like period of 1944.

Between March 2nd, the day the new alcohol plant commenced operations, and June 30, 1945, 547,272 gallons of 190 proof industrial alcohol were produced from waste sulphite liquor. Average daily production exceeded 6,000 gallons in May and June.

Net sales and other revenue amounted to $3,348,712 in the first six months of 1945, comparing with $3,398,850 for the first half of 1944.

Construction has begun on a new hydraulic barker plant, estimated to cost $850,000, which is expected to permit substantial manufacturing economies and enable the plant to turn out more pulp per thousand feet of logs consumed.

National Container Profits Up

Consolidated net sales of National Container Corporation and its subsidiaries for the period January 1 to June 30, 1945 amounted to $9,827,284.23, compared with $8,801,298.40 for similar period in 1944. Consolidated net sales for the second quarter of 1945 totalled $5,101,345.46, compared with $4,429,474.76 in second quarter of 1944.

Net profit for the first half of 1945, after all charges including estimated Federal normal, surtax and excess profits taxes totalled $632,373.95, or 95 cents per share on 660,964 shares outstanding, as compared with $588,965.37, or 89 cents a share in the first half of 1944.

Net profit after all charges, including estimated taxes, for the second quarter of 1945 totalled $328,948.09, as compared with $330,178.61 in second quarter of 1944. This amounts to 50c a share in each of the second quarters of 1945 and 1944.

Wholesaler Sales Up 2 Per Cent

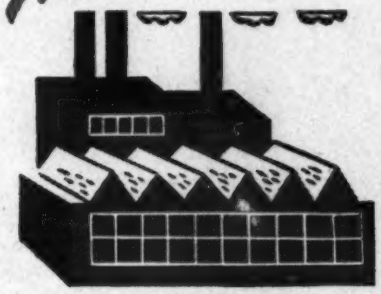
WASHINGTON, D. C., August 1, 1945—Wholesaler sales of paper and paper products totaled $35,997,000 for the first five months of 1945, a gain of two per cent over the corresponding period of 1944, according to the Bureau of Census, based on reports from a representative group of firms in this field.

Sales by this group for May, 1945 totaled $6,209,000, a decline of 5 per cent from April, and 4 per cent under those of May a year ago. Inventories by a reporting group for May gained 2 per cent over April, but were 17 per cent under May last year.

what the PAYROLL SAVINGS PLAN *means*

To you

To your Industry



and your Employees

Facts and figures prove **the Payroll Savings Plan to be a tremendous national asset. Through this plan, no less than 27,000,000 workers have so far saved more than $13½ billions to help speed victory . . . forestall inflation . . . and build peacetime prosperity!**

Did you know that yours is one of 240,000 companies maintaining a Payroll Savings Plan? Not only is this combined effort fostering national security, but also creating a lucrative postwar market for you . . . and all American industry!

Have you realized that 76% of all employed in industry are now enrolled in the Payroll Savings Plan . . . averaging a $25 bond each month per employee? Through this plan, millions are now looking forward to homes, educational opportunities and old age independence!

Surely, so great an asset to your country, your company and your employees is worthy of your continued . . . and increased . . . support! Now is the time to take stock of your Payroll Savings Plan. Use selective resolicitation to keep it at its 7th War Loan high! Keep using selective resolicitation to build it even higher!

The Treasury Department acknowledges with appreciation the publication of this message by

PAPER TRADE JOURNAL

This is an official U.S. Treasury advertisement prepared under the auspices of the Treasury Department and War Advertising Council

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Manufactured from the raw cotton to the finished felt

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TRI-UMPH all cotton, 3 ply 53 oz., widths up to 250".

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HINDLE S/54 all cotton special weave. Extra heavy duty Preshrunk, high porosity, widths up to 170".

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J. S. Harrington, Watertown, N. Y.
Christian Co., Richmond, Va.
Frank P. Wilder, Portland, Ore.
James A. Taylor & Son, Portland, Maine

N. Y. Salesmen Golf at Winged Foot

About fifty members and guests attended the annual golf outing, of the Salesmen's Association of the Paper Industry, at the Winged Foot Country Club on August 14. The weather was ideal and the course was in excellent condition. At the roast beef dinner in the evening a rising vote of thanks was given to John Dillon who, as a member of the Winged Foot Golf Club, acted as host, and Bob Estes, chairman of the golf committee, was highly commended for handling all the arrangements for this most enjoyable affair.

The following were prize winners: First low net, member, Herb Simmonds, guest, W. F. Vallely; Second low net, member, Carl Schiebler, guest, J. F. Teti; Third low net, member, Arch McCleary, guest, M. F. Roche; Four low net, member, Doc Merchant, guest, John Dillon.

At this dinner it was announced that the Eastern Division was arranging for a memorial trophy in honor of Lieut. Wally Wilson, U.S.N.R., who is the only member in the armed Forces to lose his life in World War II. This trophy will be known as the Wally Wilson Trophy and will go to the member who wins the first low net each year.

Salesmen To Meet in Philadelphia

Stanley O. Styles, president of the Salesmen's Association of the Paper Industry in a letter to members, on August 17 stated that the Philadelphia chairman, T. C. Hanna, is arranging a special luncheon under the direction of the Salesmen's Association of the Paper Industry. All members or persons eligible to join the association are cordially invited to be present. The luncheon will be held at 12:30 on Monday, September 10, at the Strawbridge and Clothiers Department Store, 8th and Market streets.

"This is the first luncheon ever held by the association in Philadelphia," Mr. Styles said, "and I hope that you will make a special effort to be present. Mr. Hanna has been working hard on his assignment to secure new members and we commend and compliment Tom on the excellent results. The Eastern Officers together with a delegation of New York Association members will be present. The agenda is now being prepared to make this luncheon interesting, outstanding and informative. The luncheon will start promptly at 12:30 and close promptly at 2 PM."

Marathon Moves Menzel to Chicago

Recent changes in personnel announced by the jobber sales division of Marathon Corporation, Menasha, Wis., include the transfer of Frank Menzel from Cincinnati to Chicago. He will take over the territories formerly handled by O. K. Sensenbrenner and Bob Grace, the former resigning to establish his own business in the industrial jobbing field and the latter to enter the United States Navy. William Vaughan, formerly located at Asheville, North Carolina, is moving to Cincinnati to take charge of the territory vacated by Menzel.

McGuire Joins Empire Box

Stanley J. Klein, President of Empire Box Corporation, announces the appointment of Edward J. McGuire to the Sales Staff of the Chicago Office, to serve as Specialties Sales Manager for the Mid-Western Division. Mr. McGuire brings to Empire a thorough knowledge of manufacturing and merchandising in the specialties field, acquired during his 17 years in the boxboard converting business.

Stainless Steel pipe by ESCO reduces shutdown troubles.

The failure of vital lines and arteries — your pipe system and fittings — means inefficiency, low production, and higher costs. Failures of this sort are reduced to a minimum by the use of *ESCO* fabricated or *Spuncast* stainless steel pipe made of alloy steels, which have proved most satisfactory for use with corrosive liquids handled in the pulp and paper industry.

ESCO pioneered the use of stainless steel in introducing it to many pulp industry applications . . . *ESCO's* first stainless steel installations are giving top-notch service — with many years of unfailing service ahead.

ESCO also furnishes equipment for use with stainless steel pipe such as special or standard cast fittings (flanged or screwed), valves of all types, tubing, and bar stock, of the analysis most suitable to the requirements of the service. Submit your problems to our engineers and metallurgists.

Stainless Steel — Blow Fittings — Blow Pit Bottoms — Screen Plates
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You'll pack your pumps, compressors, engines, valves and other apparatus less frequently when you standardize on PALMETTO Packings. Convenient standardized packages available from our Distributors in all industrial centers. Write for descriptive literature.

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PALMETTO for steam, water, air • PELRO for oils • CUTNO for alkalis • SUPER-CUTNO (blue asbestos) for acids • KLERO for foods

Self-Lubricating **PACKINGS**

SEES NEWSPRINT SCARCE FOR MONTHS

(Continued from page 13)

tion Board. At the same time, Harold R. Boeschenstein, deputy chairman, WPB, warned the group that a continuing supply of paper and paperboard is essential to the national economy.

No improvement in the domestic production of pulpwood can be expected either in the immediate future or for some time to come, Block pointed out, unless there is a marked improvement in the manpower picture, and there is little likelihood of this taking place.

As a matter of fact, the manpower situation may become worse, he said, because of the reported return, according to the War Department, of nearly 18,000 prisoners of war. These prisoners, the Army has indicated, will all be repatriated within the next four months. They have been responsible for approximately three million cords of pulpwood a year and they will be leaving the woods at a time when demand is still months behind supply and current mill inventories are at a critical low. Some industry spokesmen have even expressed the fear that many mills will have to shut down, particularly in the South, if the prisoner exodus comes about.

Lack of sufficient manpower and transportation difficulties have been the two main factors in the critical pulpwood situation since the start of the war and no relief is indicated for probably another 12 months. Very few returned veterans can be expected in the woods for at least this period, and homeward bound war workers also are expected to be few for a long while. Railroad car shortages will continue.

Other factors which tend to prevent any cheerful view of the current paper and paperboard situation despite the end of the war, include: a feared nationwide letdown in both pulpwood cutting and waste paper salvage because the war appeal no longer exists; the tremendous backlog of unfilled civilian orders; continuing demand by the armed forces, and the fact that neither Canadian pulpwood nor Scandinavian pulp is coming in to this country at anywhere near the optimistically expressed predictions, Block declared. European countries, paperstarved for four years, will be making great demands on Sweden and Norway, and Great Britain certainly will depend upon Canada for huge amounts of paper supplies, he added.

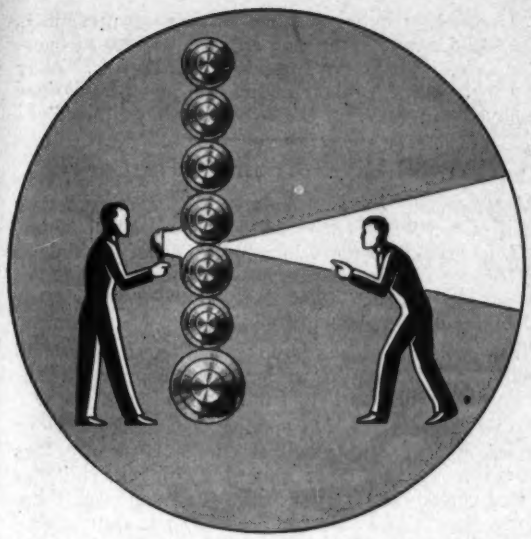
Commerce Dept. Revises Foreign Lists

WASHINGTON, D. C., August 20, 1945—The Department of Commerce is launching a complete revision of its trade lists of foreign firms that bought American goods in pre-war days, to take account of the disruption that occurred in the war, it was announced last week.

The war has resulted in widespread dislocation of productive and distributive facilities abroad, it was pointed out, and a preliminary department study of the changes in trade channels of the countries involved has indicated that thorough revision is needed.

The file of trade lists maintained by the Department, which are now to be brought up to date, records the names and addresses of potential purchasers of American-made merchandise, as well as the sources of essential materials for import by the U. S., in approximately 100 principal foreign areas.

European countries in which trade data has been greatly affected by war changes will receive first consideration, it was stated.



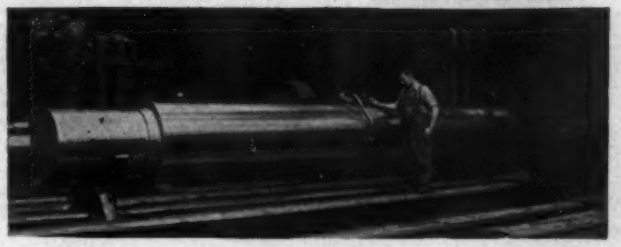
What if a little light does leak through?

When calender rolls have been finish ground, they should be placed in the stack and given the light test to check the accuracy of their contour. If the rolls are properly ground, no light should be seen through the bite, except for a short space at each end where allowance is made for heat expansion in operation.

Concavity in rolls which should be straight or slightly crowned, can result in flaking or spalling of the rolls when the stack is run without paper.

Off center crown on the bottom and next-to-bottom rolls will cause the chafing rings to wear out rapidly, resulting in heat expansion of one end of the roll and pinching of the paper.

Accurate surface contour makes Farrel rolls light-tight



During the past ninety years Farrel has developed specialized facilities for producing and reconditioning rolls to exact requirements. For "light-tight" grinding of calender rolls, for instance, there are two-wheel, swing-rest, precision roll grinders. These have the Farrel patented built-in automatic crowning device which unerringly produces the correct roll shape and the exact amount of crown required. There are also Farrel roll calipers that check diameters and roll shape within extremely close limits of accuracy.

If you are thinking of new calender rolls, roll regrinding service, or roll maintenance equipment, it will pay you to consider the facilities and experience to be found in *America's largest specialty roll shop,* at Ansonia.

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ROLLS: Chilled Iron, Dry Sand, Meehanite, Alloy Iron, Steel, Chromium Plated
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Plater Rolls
Cutting Rolls
Paraffining and Waxing Rolls
Saturating Rolls
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GRINDING MACHINES: Roll
CALIPERS: Roll
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FB-237

Farrel-Birmingham

Westminster Starts New Plant

VANCOUVER, B. C., August 13, 1945—E. M. Herb, president and general manager, F. J. Herb, vice-president, and J. J. Herb, founder, recently participated in the turning of the first sod for the new plant of Westminster Paper Company at New Westminster, B. C. When the new plant is completed the output of the Company will be doubled and its payroll increased from 335 to 410.

The $1,250,000 building program calls for extension of the finishing-room, which will be 111 feet by 126, three stories high, a new boiler-house and machine-room, both two stories high, and of reinforced concrete.

The new wharf is finished and gives direct loading access for deep sea ships. Bulkheading the property along the waterfront is completed. Ninety percent of Westminster Paper Company's products are sold in Canada.

Warrensburg Improvements Progress

WARRENSBURG, N. Y., August 20, 1945—M. Baum, head of the Warrensburg Pulp and Paper Company, which operates the local pulp mill, has announced that the fourth new grinder for the mill is now being set in place and plans have been made by his company to erect a new paper mill house as soon as the war is over and to install the second paper machine and new boilers.

Since acquiring the mill several years ago, the new owners have had much of the premises remodeled and repaired and when the new machinery is set in place it is claimed that it will be one of the most up-to-date mills in this section.

"The only trouble we are having at present is help," said Mr. Baum, "but this we expect to overcome as soon as the boys return from the war. Today we are paying top salary at the mill and all who are employed can work all the overtime they desire."

Powell River Enlarges Harbor

VANCOUVER, B. C., August 13, 1945—Harbor facilities are now being developed by Powell River, B. C. to give 50% more log storage capacity. This is part of the expansion program of the Powell River Co. Installation of a hydraulic equipment for further utilization of wood is planned shortly.

The barker plant will have special log grading, and mechanical distribution of logs in the millpond, including hydraulic barkers for large and small logs.

In the project are nine sorting pockets for various species and grades; artificial current to carry logs through sorting pockets; whole log chipper; reclamation of certain waterfront areas. Completion of these improvements will mean at least 10 per cent saving of wood per ton of product.

Sutherland to Erect Storehouse

The Sutherland Paper Company, Kalamazoo, Mich., has received priorities and has let the contract for the erection of a building for the purpose of storing wood pulp and waste paper.

Construction will begin immediately, according to Glen E. Graham, vice president. The building will be 400 feet long and 80 feet wide, with approximately 32,000 square feet of space. The cost will be about $75,000.

TRADE MARK

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BAG PLANTS AT MOBILE, ALABAMA, AND MONROE, LA.

St. Regis Starts $4,000,000 Expansion

An annual increase of more than 30,000 tons of bleached ground wood magazine and printing papers will be produced by St. Regis Paper Company through the $4,000,000 construction and expansion program which has been started at the Deferiet, New York, pulp and paper mill of the company's Printing and Publication Paper Division, President Roy K. Ferguson has announced. The increased volume will be in super calendered, machine finish and machine coated groundwood papers.

The Deferiet program provides for the initial large-scale production of bleached groundwood pulp by the new sodium peroxide process. This was developed during seven years of research by duPont scientists and has been adapted to large volume production for the first time in collaboration with St. Regis paper technicians, Mr. Ferguson said.

New construction and expansion, approved by the WPB, includes installation of a high speed 218-inch Fourdrinier paper machine; expansion of production facilities for bleached sulphite and bleached groundwood pulps; installation of a battery of the latest type Roberts' grinders; construction of a new power plant and electrical distribution system; and construction of a new bleaching plant.

George A. Fuller Company, New York, is handling the construction work, while Charles T. Main, Inc., Boston, is engineer.

For the manufacture of sulphite pulp, the addition of a 14 by 45 digester, in the same building as the three existing 14 by 38 digesters, will completely integrate the mill as to wood supply, pulp and paper making capacity. This fourth unit will provide the necessary flexibility in pulp production to schedule economically combined hard and soft wood operations.

Timber lands owned by St. Regis in New York State and New England total 350,000 acres. In Canada the company owns more than 200,000 acres and controls another 100,000 acres under Crown leases. It is estimated that the company-owned timber lands contain over 4,000,000 cords of pulpwood. These sources of wood will supply the new operations and the company's other groundwood paper mills in northern New York.

Since any one or a combination of a dozen local woods can be used in the mill, the supply of pulpwood will be reinforced by heretofore untapped local sources. The project will mean the return of many Adirondack woodlands and farming areas as sources of woodpulp. It is expected that the program will encourage the growing of wood as a business by both small and large landowners.

The Deferiet mill's new No. 6 paper machine, the giant Fourdrinier, formerly operated at Algonquin Paper Company's Ogdensburg, New York, plant, will be partially rebuilt for installation in a new building now under construction. Integrated with Deferiet groundwood and sulphite production, the machine will be designed to operate up to 1200 feet per minute and produce 104 tons per day of paper. The machine includes an 80-foot long Fourdrinier wire section and thirty-four 212" wide by 48" diameter dryers.

The other existing machines and their wire widths are: No. 1—145 inches; No. 2—126 inches; No. 3—156 inches; No. 4—160 inches; and No. 5—121 inches. No. 1, No. 4 and No. 5 machines will produce machine coated groundwood paper. Two large super calenders will be installed to finish the output of No. 3 and No. 4 machines.

The wood handling project at Deferiet includes equipment to furnish 4-foot pulpwood to the groundwood mill. The mill formerly used 2-foot pulpwood. Six Roberts' magazine type grinders will be installed to replace the 28 three pocket grinders now in operation. Other additions include heavier conveyors, a new drum, a larger storage pit, and a conveying flume for the 4-foot logs which will eliminate all manual handling of wood in the plant.

Another important feature of the mill is the installation of a complete new high pressure boiler plant. Major equipment will include steam generators

ROY K. FERGUSON

operating at 850 psi, a 6,000 kw non-condensing turbine to supply 150-pound steam at the mill's processing level, and a 5,000 kw condensing turbine to hold the steam load in running the paper machines and vats. Estimated cost of the steam and power distribution improvements is one and one-quarter million dollars. Supplementary off-peak power will be bought from the Niagara-Hudson Power Company.

C. B. Martin, vice-president in charge of operations, and Lyman Beeman, earlier this year appointed over-all superintendent of a group of St. Regis mills, have their headquarters at Deferiet. Other key personnel at Deferiet include Edward Marshall, mill manager; P. J. Baron, chief engineer; Fred C. Goodwill, technical director; and D. C. Mather, chief chemist.

Sale of the augmented volume of bleached groundwood paper will be directed by E. G. Murray, Manager of Paper Sales, located at the company's main offices, 230 Park Avenue, New York.

Production includes book, magazine, catalogue, directory, writing, mimeo and communications papers. Lightweight groundwood papers are being used for a great variety of printed matter, including manuals, bibles, pocket books, national magazines, and for the overseas editions of *Time*, *Newsweek* and *Life* magazines, where opacity, strength, light weight and excellent printing qualities are important factors

Mathieson Shifts Heads

Maurice C. Taylor, formerly manager of research at the Niagara Falls laboratories of the Mathieson Alkali Works, has been appointed resident director of research and development, according to an announcement by George W. Dolan, president. Other research department changes are announced as follows: J. Douglas MacMahon, heretofore assistant manager of the sales development department, has been named assistant to the technical director; C. N. Richardson, superintendent of pilot operations, becomes manager of research engineering; and C. Gerald Day, a superintendent in the development department, becomes research and plant liaison engineer.

Both Mr. Taylor and Mr. MacMahon will report to Dr. G. P. Vincent, recently named technical director.

This reorganization of the research department is in line with the company's policy of continued aggressive research and the coordination of sales development and plant operations with research.

We're proud of the background of the W. G. P. organization which started over 85 years ago. None of the founders are among us today, but all of us here at W. G. P. have been in the paper business for many years. For example: The three principals have collectively been connected with this firm for over a century. This long experience and service is undoubtedly responsible for the confidence and the continued good will that W. G. P. enjoys today. W. G. P. is vitally interested in making additional mill connections—both for the present and the future. If any part of your output is available for the domestic or export field, write us at once.

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PAPER AND BOARD

Taylor Helped on Atom

It has just been revealed that The Taylor Instrument Companies of Rochester have played a major role in the manufacture of the new Atomic Bomb termed by high War Department officers as ". . . the biggest secret of the War."

In 1943 the Companies' Rochester plant was inspected by a committee charged with locating industrial plants throughout the nation sufficiently large to handle all the ramifications of the huge project. On the basis of its complete facilities and large engineering staff Taylor was selected as prime contractor for instrumentation for the Kellex Corporation in its work pertaining to the Manhattan District Project. Several of the large instrument manufacturers were asked to submit instrument designs to meet the extremely close process tolerances. Taylor's designs were selected. This required a heavy tooling program; the design and construction of highly specialized testing and calibrating equipment; and the whole program reduced to a mass production basis.

Large Flow Rotasleeve

The new Fischer & Porter Rotasleeve effectively utilizes all the basic advantages of the area-type flow meter for the measurement of large flows of liquids and gases. A further development of the rotameter principle, this amazing new instrument gives high accuracy, straight line calibration, wide flow range, low pressure loss and instantaneous response to flow changes.

The Rotasleeve is a tapered metal sleeve which fits into standard pipe tees from sizes 3 inches and up. The flow enters the bottom of the Rotasleeve causing the flow indicating float to move upward and to assume a position in direct proportion to the actual rate of flow. Flows as large as 14,000 GPM of liquid and 16,000 CFM of gas can be handled. The Rotasleeve is made for direct reading and for remote reading in recording and recording-controlling types. Bulletin 82-A, which gives complete information, will be sent upon request to Fischer & Porter Company, Hatboro, Pa.

F. H. P. Drive Tables

A new wedgbelt drives catalog of the American Pulley Co., Philadelphia, Pa., contains complete price lists and specifications of the company's new line of F.H.P. sheaves and belts. It also contains four pages of condensed, simplified drive tables for a wide range of center distances and drive ratios.

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Soda Ash

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PITTSBURGH, PA., *and Everywhere*

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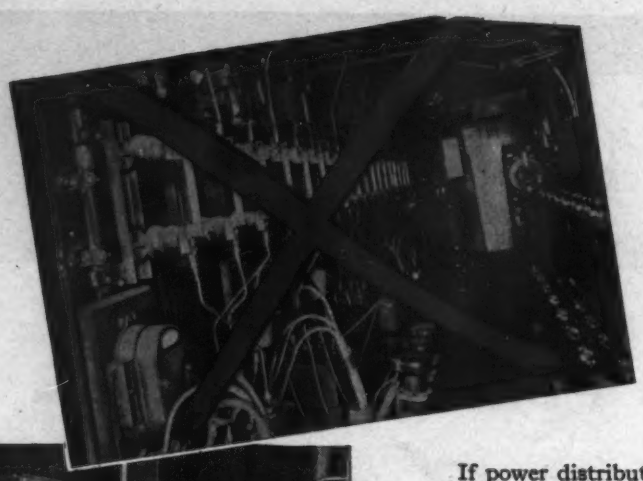
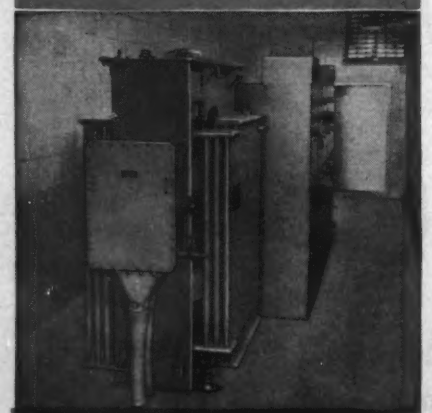


Go

Here's the modern form of switchboard for paper mills—G-E factory-assembled metal-clad switchgear, with easily removable, oil-less circuit breakers. All live parts are completely enclosed in grounded steel compartments. Additional units are easily added.



A modern load-center unit substation, located in a room directly adjacent to plant production area. Short runs of flexible, interlocked-armor cable carry power to the points of use.

If power distribution in your plant is now handled at 600 volts or less, you're probably looking forward to its eventual replacement with a more adaptable and reliable system using copper-saving high-voltage feeders.

In the meantime, should new capacity be needed to handle an immediate load increase, here's the kind of a system plan that will contribute to both goals.

1. There's no faster way to raise the capacity of your power system to meet the new requirements.

2. You won't be adding to your investment in a low-voltage system—one that becomes more risky *throughout* whenever new supply-capacity is added. Instead, you'll be taking the first step toward a complete, co-ordinated *load-center* system, with primary distribution at 4160 volts for medium-size mills or 13,800 volts for larger mills.

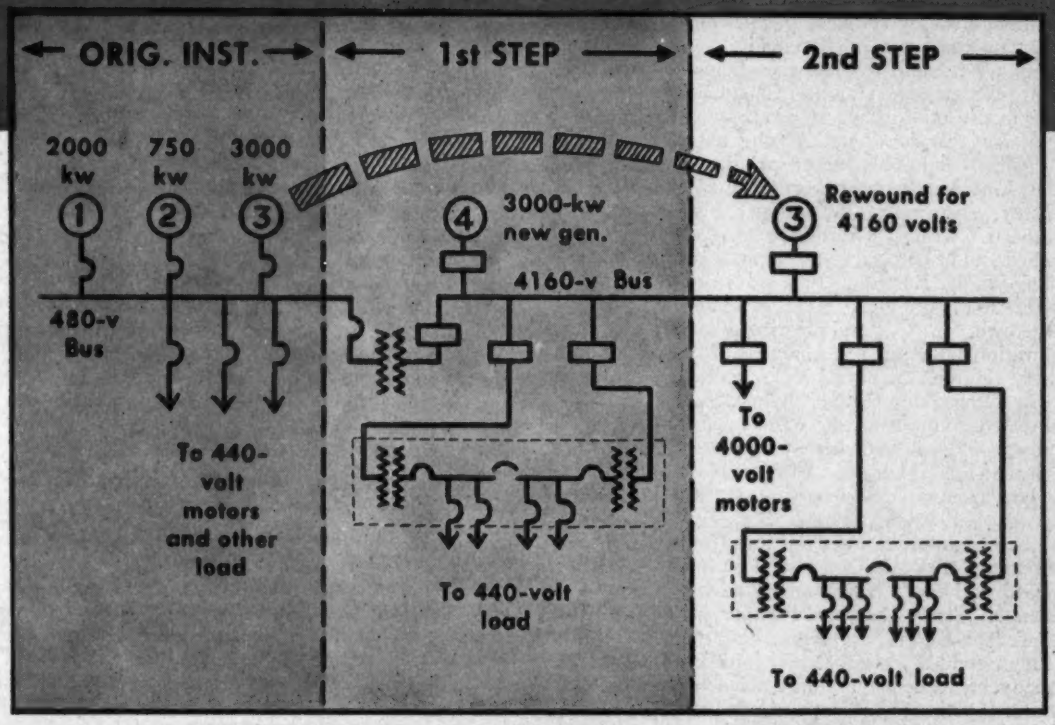
When the changeover is carried through to completion, the plant will be equipped with an unusually reliable power system, free from voltage deficiencies and the hazards of inadequate interrupting capacity. Continuity will be protected. Final installed *costs* will be *lower* than if expansion and subsequent modernization had not been planned together at the start.

Why not check now with G-E engineers fully familiar with paper-mill practices on the possibilities of power-system improvement for your plant? ***Apparatus Dept., General Electric Company, Schenectady 5, N. Y.***

Load-center unit substations can be located almost anywhere in the plant. Transformers are steel enclosed and filled with G-E's noninflammable cooling and insulating liquid—Pyranol. No Pyranol transformer has ever burned or contributed to a fire. Drawout air circuit breakers are fully co-ordinated with the transformer and are convenient to inspect.

Modern AS YOU GROW

EXPANSION OF POWER SYSTEMS THE LOAD-CENTER WAY CUTS THE COSTS OF FULL MODERNIZATION LATER



ORIGINALLY, this plant was equipped with low-voltage turbines (1, 2, 3) serving all load through a 480-volt bus. Plant expansion led to a need for increased generating capacity to meet power requirements at points remote from the switchboard. Long 480-volt feeders would have required a heavy investment in cable.

FIRST STEP in the "load-center" expansion plan was to install a new 3000-kw generator (4) serving new loads via 4160-volt feeders to unit substations at the load-centers. A transformer tie to the existing 480-volt system gives extra flexibility in handling loads. A "secondary selective" unit-substation link gives a high measure of reliability.

SECOND STEP is to rewind the low-voltage turbine (3) for 4160-volt operation, transferring more of the plant load to secondary selective unit substations served from the high-voltage bus. Eventually, the low-voltage bus will be completely supplanted.

Buy all the BONDS you can—*and keep all you buy*

LOAD-CENTER POWER DISTRIBUTION SYSTEMS

GENERAL ELECTRIC

Sigel Sees Sustained Demand

Only a short period of hesitation may be expected to interfere with the commencement of sustained maximum production which will be demanded of American pulp and paper mills. Arthur J. Sigel, vice-president of Gottesman and Company, Inc., New York City, declares that capacity output for an indefinitely long time ahead will be required to fill old and new civilian needs and to replenish stocks and inventories of paper and paper products so necessary for the efficient operation of America's gigantic industry, trade and commerce. None of the many elements, he stated, are lacking for the maintained output at maximum capacity of America's papermills. World War II helped create a real appreciation of the essential part the pulp and paper industry has always played in America's progress and this, he said, was only part of the favorable outlook that brightens the future prospects of American papermakers.

Similar to the outstanding position achieved by the Gottesman company in the field of Swedish pulp supplies, the company likewise holds a most important place in American and Canadian pulps, representing many of the largest producers of Kraft and Sulphite on this continent. Among its exclusive selling agencies and mills whose products are available to the American papermaker through Gottesman & Company, Inc. are: International Paper Company (Southern Kraft Division) manufacturers of Bleached and Unbleached Sulphate Pulps at the Bastrop mill, Bastrop, La., Moss Point, Miss., Mobile, Ala., Camden, Ark., Panama City, Fla., Georgetown, S. C., and Springhill, La.; Eastern Corporation with mills at Lincoln, Maine and South Brewer, Maine, manufacturing Bleached Sulphite and dissolving pulp; Hawley Pulp & Paper Company, Unbleached Sulphite manufacturers at Oregon City, Oregon; Gaylord Container Corporation, producers of Bleached and Unbleached Kraft Pulp at Bogalusa, La.; Container Corporation of America, manufacturing Unbleached Kraft Pulp at Fernandina, Fla.; The Champion Paper & Fibre Company, manufacturers of Bleached Hardwood Sulphite, Bleached Sulphate and Soda Pulp at Pasadena, Texas and Canton, N. C.; St. Lawrence Paper Mills Company Limited, Three Rivers, Quebec, Unbleached Sulphite and Dry Groundwood; Lake St. John Power & Paper Company Limited, makers of Unbleached Sulphite at Dolbeau, Quebec; Mohawk Corporation Limited, Riviere-du-Loup, Quebec, Moist Groundwood, and Halifax Power & Paper Company Limited of Sheet Harbour, Nova Scotia, also Moist Groundwood.

Many Branch Contacts Abroad

Many of these brands have been exported to South and Central America and to Europe and across the Pacific by Gottesman through its agencies located in: Havana, Cuba; Caracas, Venezuela; Santiago de Chile, Chile; Buenos Aires, Argentina; Rio de Janeiro, Brazil; Sao Paulo, Brazil; Montevideo, Uruguay and London, England.

Gottesman and Company, Inc. was established in 1886 and has been directed by its present chief executive, D. Samuel Gottesman, as President since 1919. The other officers of the Company are: Arthur J. Sigel, Vice President; Samuel Dauman, Vice President; Benjamin I. Sheldon, Treasurer; Jerome J. Altman, Assistant Treasurer; and B. Emanuel, Secretary.

Canadian Technical Section Formed

Technical information in the pulp and paper business in British Columbia will be available to 55 new members of the Technical Section of the Canadian Pulp and Paper Association, Montreal. Douglas Jones, secretary-engineer of the section, announced this news after a tour of pulp and paper mills in the Province.

The companies feel that free interchange of technical information in the industry is of the utmost importance and the formation of a British Columbia branch of the Technical Section is envisioned in the near future, Mr. Jones said.

Mr. Jones visited company mills of British Columbia Pulp and Paper Company Limited, Woodfibre Pacific Mills, Limited, Ocean Falls; Powell River Company Limited, Powell River; Sorg Pulp Company Limited, Port Mellon; Sidney Roofing & Paper Company Limited, Victoria; Westminster Paper Company Limited, New Westminster.

Decora Paper Corp. Formed

[FROM OUR REGULAR CORRESPONDENT]

FORT EDWARDS, N. Y., August 6, 1945—Incorporation articles have been filed under state laws by the Decora Paper Corporation showing 1,000 shares of stock with no par value. The new concern plans to process, laminate and coat paper, aluminum and lead foil and fabrics at the plant recently vacated by the Amalgamated Paper Co. Plans are also under way for building an addition to the present structure which will be used for expansion. A large plot of ground near the mill has already been acquired for this purpose. Among the directors of the company are Walter Ryder, of Long Island, Leland Smith, of New Jersey, and Frank Smith, of Granville. Operations here will be maintained in conjunction with the main plant at Haledon, N. J.

Propose to Release Chlorine

WASHINGTON, D. C., August 13, 1945—In view of existing surpluses of chlorine for the third quarter of this year, revocation of Order M-19, governing chlorine, by September 30 was recommended by the Chlorine Alkali Industry Advisory Committee at a recent meeting, the War Production Board reported today.

The next meeting of the committee will be held on September 6, when a further review of the situation will be made.

Campbell Joins Pacific Mills

VANCOUVER, B. C., August 18, 1945—Edward W. Campbell has joined Pacific Mills, Limited, as personnel manager. Canadian-born and a life-long resident of British Columbia, Mr. Campbell was formerly labour relations officer for the Consolidated Mining and Smelting Company of Canada, Limited, at Trail, B. C. Mr. Campbell took over his duties at Pacific Mills Limited head offices on August 13th.

Rosin Inventory Period Widened

Consumers of gum and wood rosin are now permitted to accumulate five month inventories instead of the three month inventories formerly allowed, the War Production Board reported last week. The increased inventories will take care of the needs of industry during the winter months when gum rosin is not being produced, WPB explained.

Laucks to Build at Seattle

SEATTLE, Wash., August 11, 1945—Expansion of chemical manufacturing facilities on the West Coast is foreshadowed by the announcement here today that Monsanto Chemical Company, through its Seattle subsidiary, I. F. Laucks, Inc., has purchased about 29 acres of land south of the city limits. The company will erect the most modern plywood adhesives plant in America on the site, it was announced, and the new facility will combine Laucks operations now carried on in two present Seattle plants.

Produced at the new location will be synthetic resins for adhesives, and coatings and wood preservatives now made in the two Laucks plants. It was indicated that offices and research laboratories of the subsidiary which Monsanto acquired last year, will eventually be moved to the new location.

The property is located approximately three-quarters of a mile south of the Seattle city limits, and is presently the site of a prisoner-of-war camp.

Monsanto Helped Produce Atom Bomb

ST. LOUIS, August 11, 1945—Monsanto Chemical Company and many of its leading scientists have been closely identified with the development of the atomic bomb since the inception of the project, the company announced this week. Many picked scientists have been engaged on part of this work at the company's Dayton operations, but so well was this number one secret kept that even fellow workers in the company's Dayton operations did not know what was being done. Even some of the company's high officers were uninformed about it.

Monsanto's principal contribution to the program was research, process development, design of plant and subsequent production of some of the material. Later the Company assumed responsibility for the operation of a large part of the Oak Ridge, Tennessee, project.

Pennsalt Offers PRF Cement

Pennsalt PRF Cement, a new and superior resin-type cement, has recently been developed by the Pennsylvania Salt Manufacturing Company. This cement is a quick-setting, cold-hardening acid, alkali and solvent proof product composed of a liquid and a powder which, when mixed, react chemically to form a cement. PRF has been designed specifically for bonding corrosion-proof brick and tile in uses where both acid and alkalis are encountered. Typical applications are laying floors and drains, and lining tanks in electroplating shops where a cement is required that will resist corrosive acids, alkalis and solvents.

Williams Joins Foxboro New York Staff

The Foxboro Company, Foxboro, Mass., maker of industrial instruments for measurement and control, announces that Clarence Leslie Williams has joined its staff of sales engineers in the company's New York office, 420 Lexington Ave. He has been assigned to the northern New Jersey territory and has already entered upon his new duties. Mr. Williams is thoroughly at home in this area, being a native of New Jersey and a graduate of Stevens Institute of Technology, at Hoboken. A broad background of diversified business experience has equipped him for capable and efficient assistance to Foxboro customers in any problem of industrial instrumentation.

Goodrich Promotes Rollin Hager

Rollin D. Hager has been named general superintendent of the Industrial Products division of The B. F. Goodrich Company. Hager succeeds G. L. Matthias, who has retired because of illness. H. L. Dixon has been appointed to Hager's previous post as production manager of the division, and E. L. Slingluff as manager of reclaim manufacturing to succeed Dixon.

Hager joined B. F. Goodrich in 1925 as a clerk, later went into the factory, and was named production superintendent of the company's industrial products plant at Cadillac, Michigan in 1937. He later served as production superintendent, assistant general manager and manager of the Lone Star Defense Corporation, a subsidiary which operated one of the largest bomb and shell loading plants for the government in Texas. He was named production superintendent of the industrial products division 18 months ago.

Cleveland Crane Sets Up New Division

WICKLIFFE, Ohio—The Cleveland Crane & Engineering Co., announces the establishing of a new sales division to be known as the Heavy Machine Division with headquarters in Wickliffe. The division will be responsible for the sales of heavy Cleveland overhead traveling cranes and Steelweld bending presses, bulldozers and special machinery. Until a few weeks ago the Steelweld line of machines was distributed through a general sales agent.

Charles H. Saiter has been appointed sales manager in charge of the Heavy Machine Division. He was sales manager of the former Heavy Crane department, and has been with the company for 23 years in various engineering and sales capacities.

De Kiep Joins Electric Machinery

Electric Machinery Manufacturing Company, Minneapolis 13, Minn., has appointed James De Kiep as chief engineer in charge of electrical and mechanical design and development. Mr. De Kiep was formerly manager of the a-c motor engineering department at Westinghouse Electric Corporation, East Pittsburgh. He is an electrical engineering graduate of the University of Michigan, has had extensive experience in the design of rotating electrical machinery, and has written several technical papers including a recent survey on the application of Silicone insulation to electric motors.

Westinghouse Acquires B. F. Sturtevant

BOSTON, Mass., August 13, 1945—Acquisition of the B. F. Sturtevant Company, the pioneer in the design and manufacture of air handling and processing equipment, has been announced by A. W. Robertson, Chairman of the Westinghouse Electric Corporation. The Sturtevant Company becomes a wholly-owned Westinghouse subsidiary, operating as the B. F. Sturtevant Company, a Division of Westinghouse Electric. Management of the Sturtevant company will be assumed by Westinghouse about Sept. 1.

Celebrates 35th Year at Phila. Quartz

William Martin, vice-president in charge of Purchasing and Traffic of Philadelphia Quartz Company, manufacturers of silicates of soda, celebrated on August 1st, thirty-five years of continuous service. He was tendered a testimonial luncheon by the officers and directors of the company.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
W. L. Cook, Editor

PAPER OUTLOOK BRIGHT

Paper manufacturing capacity in the United States is so relatively large that any substantial cutback in all-over government orders is certain to create a very favorable paper supply situation. The end of hostilities in the Pacific should soon alleviate the tight paper and paperboard supply. It is difficult to estimate the tonnage required by the government at the start of the end of the war, without more factual data on the paper tonnage required by the several foreign aid and relief agencies. Although lacking any special information we do not share in the viewpoint that a very slow return to a normal paper supply for trade purposes appears inevitable, or that the government may not relinquish controls limiting the fullest consumption of paper at the earliest possible date. The outlook at this time appears bright and whatever trepidations may have been caused by the liberal policy of the late administration relative to the socialization of industry, do not now appear to have any particular significance in the future.

We are in accord with the latest industry report of the Department of Commerce which regards developments in the pulp and paper industry as generally encouraging, with indications of substantially larger supplies going into civilian channels. The Department report points out that some time will elapse, however, before supplies reach a normal relationship with demands in view of the low inventory positions of various consumers and distributors. A similar situation exists with respect to the paper mills, especially those depending upon market wood pulp, where it will probably take several months to accumulate reasonable pulp inventory reserves. A most encouraging factor in the paper supply situation is found in the data on domestic pulp production which continued at a high level through June, with production in the first half of this year about 5% larger than in the same period in 1944.

Currently, there is a substantial cutback in nitrating pulp requirements, allowing a diversion of more bleached sulphite pulp for paper. This, combined with current and expected imports of Swedish pulp, should assist in materially easing white paper supplies. Nearly 50% of imports of Swedish pulp during July were sulphite.

Another favorable indication of a better balanced paper supply is indicated in the steps being taken by the Forest Products Bureau of the War Production Board, in easing wartime restriction, which are working very well, with excellent cooperation from the industry.

Segment allocation as established for the third quarter has thus far not resulted in any major grade switches so that adequate supplies of practically all important grades of paper are being produced to meet important needs. Cancellation of the chlorine limitation order has not caused any unusual difficulties, the Department reports, even though some mills producing their own chlorine may be in a slightly improved position than mills depending upon market supplies. Only one problem of major proportions is seen by the Department at this date.

This is the question of prisoner-of-war labor in the South being diverted to agricultural work during the current month and fall and the likelihood that prisoners will be returned to their native lands, possibly starting in the middle of November. The critical significance of kraft pulp produced in the South for containers and wrapping materials naturally ends with the surrender of Japan. Of greater importance is the domestic need for production of civilian goods in the early months of the reconversion period, which necessitates the urgency of maintaining pulpwood supplies and wood pulp production in the southern region for months to come.

Although exports of paper have in the past been extremely small, the Department of Commerce directs attention of domestic manufacturers to the prospect of an early relaxation of export controls. In the case of both paper and wood pulp, domestic manufacturers who have a current or prospective interest in foreign markets for their products would take adequate steps to voluntarily make available for export a reasonable tonnage of their production, either through their own export department or through their export commission agents.

This fact is viewed by the Department as highly significant if foreign markets and their respective import representatives, established during the war at some sacrifice to our own domestic civilian supplies, are to be retained in the future. Mills or export agents should properly advise their foreign customers of the peculiar circumstances existing during the war and up to the present time, in an effort to maintain these trade channels and markets.

Relative to the current tight newsprint supply the Department report states that, for several months ahead the continental European countries will be confronted with a scarcity of newsprint. Finland was formerly the major European supplier of newsprint and only small supplies are expected to be available from that source over the next few months. Swedish mills are not inclined to increase newsprint production because of the necessity for using coal and the divergence of fuel from pulp mills to paper mills. Thus, it is possible that moderate quantities of North American newsprint and other grades of paper will have to be made available to the liberated countries of Europe until northern European or other European production can meet the bare minimum requirements.

Says Taxes Discourage Reforestation

VANCOUVER, B. C., August 13, 1945—Onerous taxation is the greatest barrier to reforestation by British Columbia private industry, F. D. Mulholland, of the Forest Engineers' Association, told the forest inquiry at Vancouver, B. C., recently.

Mr. Mulholland said that a large part of this taxation went to the Dominion. He suggested that, except for wartime needs, cost of silviculture by the industry should be deducted from income tax.

In detailing burdens on the industry, Mr. Mulholland said that producers were hampered by many influences beyond Provincial control, such as the United States tariff, Federal taxation, trade agreements and vagaries of the world market.

He added that 70 per cent of forest fires was the result of the public's carelessness. Emphasizing the need of an educational program, Mr. Mulholland declared: "If such a program could reduce the damage done by public carelessness, it might result in incalculable growth of timber and increase in production."

Mr. Mulholland supported voluntary action as far as possible in regulating the annual timber cut. He favored a "severance tax," as offered by the industry, in cases where an operator did not wish to reseed a cut area.

Wholesale Volume Up Two Per Cent

WASHINGTON, D. C., August 13, 1945—Wholesalers' sales of paper and products totaled $43,768,000 for the first six months of the year, a gain of two percent over sales of the same period of 1944, according to the Bureau of Census, based on reports of a group of firms in this field.

June sales were $5,904,000, level with those of May, and 1 percent less than for the same month last year, the report added. June inventories were 19 percent under those of June, 1944.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
July 7	47.9	July 8	50.9
July 14	88.5	July 15	87.7
July 21	89.8	July 22	91.2
July 28	93.4	July 29	91.3
August 4	93.6	August 5	89.8
August 11	*90.6*	August 12	91.2

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	88.2	92.5	90.6	92.4	88.1
1945	86.7	89.4	90.2	88.1	89.8	91.2	*80.8*						

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year to Date...	68.2	78.7	87.0	94.0	94.2	88.0	87.6	*88.1*
Year Average..	71.5	83.4	85.6	97.4	90.4	87.8	88.1	

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1945		Corresponding Weeks—1944	
July 7	62	July 8	60
July 14	90	July 15	91
July 21	96	July 22	94
July 28	95	July 29	96
August 4	94	August 5	96
August 11	*94*	August 12	96

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	91	95	97	97	96	96	*86*						

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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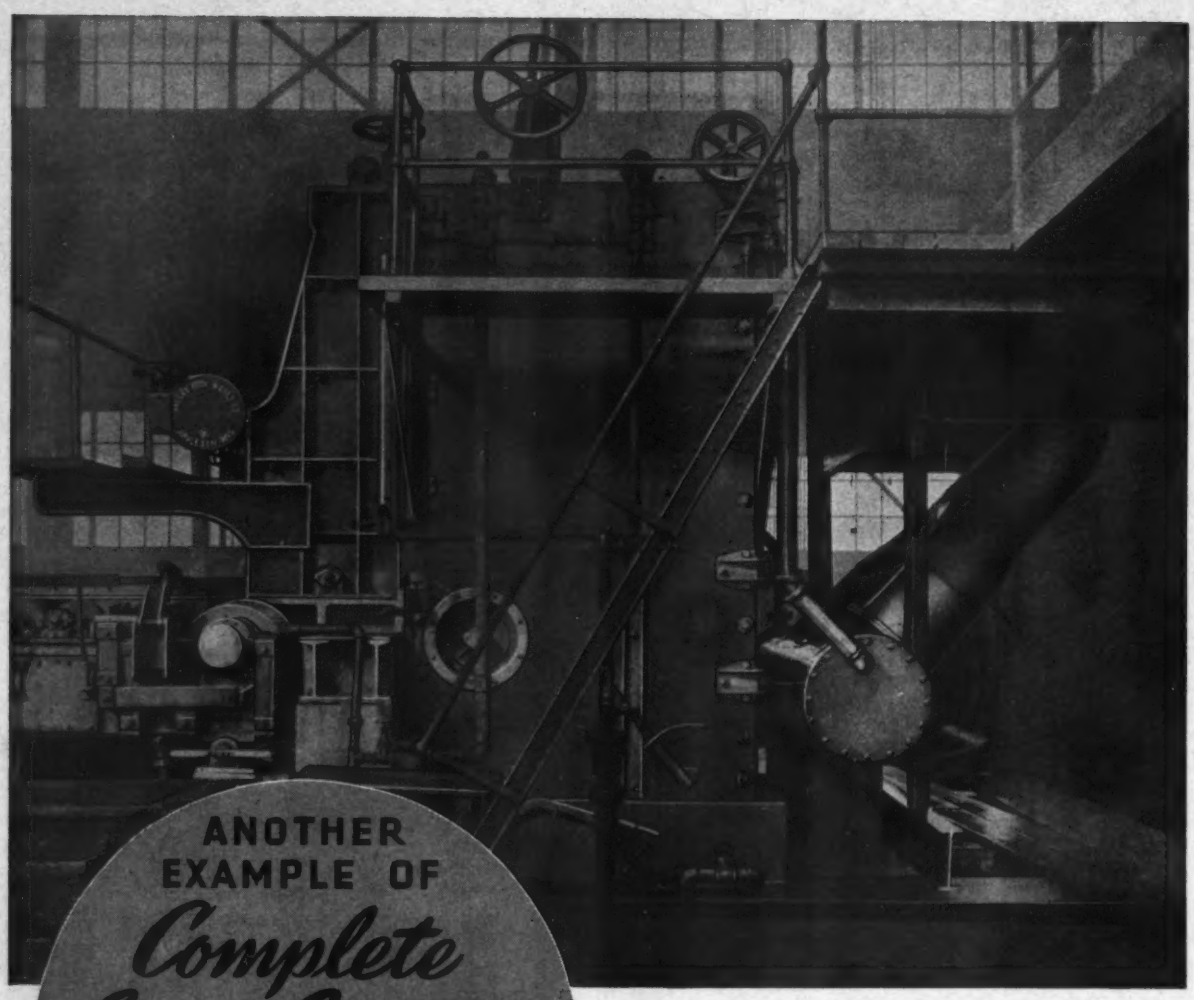

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Sodium Aluminate and the Sulphate Ion In Paper Sizing*

By William S. Wilson[1]

Abstract

Experimental data show that the presence of excess alkali and sulphate ion or other similar anions in a paper beater is deleterious to sizing against writing ink with rosin and alum.

Large amounts of sulphate are introduced when alum requirements are high because of excess alkali in the beater. The higher the sulphate content the lower the pH must be for optimum sizing.

If excess alkali is avoided and the sulphate content is kept to a minimum with a highly basic alum, sizing at 6 or 7 pH equivalent to that at 4 pH can be obtained. Although the ultimate in sizing at high pH is not possible with commercially available materials, considerable can be accomplished in this direction by using the equivalent of a high basic alum obtained with a combination of regular alum and sodium aluminate.

It appears that papermakers know and rejoice in the fact that a beater, before the addition of alum, is a fairly alkaline system. This alkalinity may be a cause for rejoicing as far as the beating operation is concerned, but from the standpoint of the ink penetration test it is most decidedly a cause for lamentation.

Sizing Theory

The hydrolysis of $Al_2(SO_4)_3$ is so often thoughtlessly written as an equation rather than an equilibrium that many people have become accustomed to considering alum as an acid. Based on this false premise, the original alkalinity of the beater is assumed to be neutralized by the acidity of the alum and therefore of no further account. What really happens can be illustrated by the equation:

$$Al_2(SO_4)_3 + 6\ NaOH = 2\ Al(OH)_3 + 3\ Na_2SO_4 \qquad (1)$$

The net result of this reaction is that some high potential alkalinity (NaOH) has merely been changed for some low potential alkalinity ($Al(OH)_3$). The above equation of course only represents conditions existing in the early stages of adding alum to a paper beater. Dependent upon final conditions the alumina not present as ions may be in the form of anything from an acid to a very basic aluminum sulphate.

These hydrated alumina complexes are anion exchangers. If the SO_4 ion concentration of the solution is increased some of these anions go onto the complex and drive the corresponding number of OH ions into solution. If the OH ion concentration of the solution is increased, some of the SO_4 ions on the complex are chased off into solution and their place taken by OH ions. Thus, if SO_4 ions are added to the system, an unexpected rise in pH is obtained. If SO_4 ions are removed from the system, SO_4 ions hop off the complex and their places must be taken by OH ions with a consequent drop in pH. If OH ions are added to the system, some of these ions replace SO_4 ions on the complex, and the expected rise in pH is not obtained. If OH ions are removed from the system, some of the OH ions on the complex are replaced by SO_4 ions, and there is not the expected drop in pH. Removing OH ions is the equivalent of adding H ions. Therefore, adding H ions increases the amount of SO_4 on the alumina complex.

This buffering action of the alumina complex is well understood from the qualitative point of view. As several simultaneously operating adsorption isotherms are involved quantitative predictions are practically impossible. The more SO_4 there is in the system the more SO_4 goes into the complex for any given drop in pH, and conversely the less the change in pH for any given addition of acid or H ions. This is why the last part of an alum addition has such a slight effect on pH.

If sodium aluminate is added to a papermaking stock containing ordinary rosin size, no sizing will be obtained. Pulp is a cation exchanger almost always found in its calcium or sodium form. In a previous paper the author has shown how to convert it to its hydrogen form. Rosin size is also a cation exchanger, always found in its sodium form, and in addition carrying a relatively enormous amount of excess alkali. This sentence may arouse some doubts and so deserves an explanation. Rosin in a beater consists of discrete particles of such size that probably not over 5% of the acid groups are actually on the surface, the remainder being in the interior of the particles. Size is generally made with at least 70% of the theoretical amount of alkali. Therefore, there is

$$\frac{70 - 5}{5} = 1300\%$$

excess caustic in ordinary low alkali commercial size. This is why there are frequent instances of the more size used the lower the sizing. There is no practical way of avoiding this difficulty, but it is there nevertheless.

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

[1] Research Director, Monsanto Chemical Co., Merrimac Div., Boston, Mass.

There is a very practical laboratory method for circumventing this trouble. Rosin can be dispersed by the rapid dilution of an alcoholic rosin solution. Thus, by acid washing the pulp and using alcoholic rosin a beater can be started which not only contains no alkali but actually contains considerable amounts of potential H ions on the anions, pulp, and rosin. If sodium aluminate is added to such a stock, sizing appears at once and rises to a maximum as the amount of sodium aluminate is increased. Further additions of aluminate decrease sizing which eventually becomes zero when aluminate has been added to bring the pH up to around 9.

If Al ions are believed to be the active principle in engine sizing, it must be believed that the potential H ions on the pulp and rosin converted the alumina in the aluminate to Al ions because no sizing was obtained when the pulp and rosin were in their sodium form. Incidentally, those who believe in the colloidal alumina idea can also have a Roman holiday with the data to be shown later.

If it is assumed that the Al ions come from the equilibrium

$$Al(OH)_3 \rightleftarrows Al^{+++} + 3\ OH^- \qquad (2)$$

what appears to be a good explanation is had for what happened in the successful experiment with sodium aluminate. The H ions from the pulp and rosin reacted with the OH ions from equilibrium (2) thus moving the equilibrium to the right or increasing the Al ion concentration. These Al ions went on the pulp and rosin displacing their equivalent amount of H ions which continued moving equilibrium (2) to the right. As the amount of aluminate increased the amount of $Al(OH)_3$ was increased and therefore, the number of Al ions.

Eventually, the alkali added with the aluminate built up to the point where OH ions were added faster than the pulp and rosin, rapidly being exhausted of potential H ions, could kill them off. At this point, the equilibrium began moving to the left. Eventually, the OH ion concentration became so high that no Al ions could exist and sizing returned to zero.

This business of using H and OH ions to kill each other off in a water system is a marvelous convenience. Unfortunately, they are the only ions that can be thus summarily disposed. What happens when equilibrium (2) is rewritten starting with one of the basic sulphate alumina complexes previously referred to?

$$AlOHSO_4 \rightleftarrows Al^{+++} + OH^- + SO_4^{--} \qquad (3)$$

The OH ions in this equilibrium can be killed off as in the case of equilibrium (2) but an SO_4 ion or any other anion put in its place can not be destroyed. Hence, to obtain an equivalent Al ion concentration on equilibrium (2) and (3), one would have to kill off more OH ions in the case of (3) to compensate for the inability to destroy SO_4 ions. It has, however, just been shown that if H ions are added to the system some of the OH ions on the complex will immediately be replaced with SO_4 ions. This results in a complex higher in SO_4 than that represented in equilibrium (3) and a still lower OH ion concentration will be necessary to obtain the desired Al ion concentration. This is presumably a deadend road. Somewhere along the line, the drop in pH will do more harm by increasing the SO_4 content of the complex than it does good in decreasing the OH ion concentration. At this point, a drop in pH will decrease, rather than increase, the Al ion concentration.

Boiled down this means that in every system containing SO_4 ions there will be an optimum pH for maximum Al ion concentration. Either above or below this pH the Al ion concentration will decrease. Since this optimum depends upon the ratio of SO_4 to Al_2O_3 in the complex the optimum pH would be expected to be higher if the SO_4/Al_2O_3 ratio is low and lower if the ratio is high.

When these alumina complexes become insoluble and fall out of solution the ratio SO_4/Al_2O_3 is always lower than in the system from which they came.

If this is also true of complexes which remain dispersed, then the more alum put in a system the higher the SO_4 driving force and therefore the higher the SO_4/Al_2O_3 ratio of the complexes. This means a continual drop in optimum pH as the amount of alum is increased in the system. Experimentally this proves to be the case. Now one could imagine a case in which the alum was so basic (low SO_4/Al_2O_3 ratio) that the complex could take on SO_4 faster than it was put into the system with the basic alum. In this case optimum pH would increase with increased alum. This can be shown experimentally to be true.

Alumina can be added to the system in all kinds of forms from acid alums through various degrees of basic alums to sodium aluminate. These materials can be added in various amounts as well as varying composition. Depending upon the Al ion demand of the pulp and varying amounts of size part of the alumina is removed from the system as combined aluminum. Considering the wide range of possible system compositions just indicated it is highly probable that the Al ion concentration is the largest single variable in engine sizing.

On the other hand, there is a possibility that all these system compositions give about the same Al ion concentration if each happens to be at its optimum pH. Proof of this will have to depend upon experimental evidence as the complications involved are too much for any brand of mathematics. It is also perfectly possible that Al ion concentration is practically independent of dilution. The pH goes up but SO_4 concentration goes down on dilution. Our experiments lead to the belief that this is true.

The key to obtaining the experimental evidence is in getting the maximum amount of potential H ions into the system before the desired form of alumina is added. This can be done by getting the pulp converted to its hydrogen form and using an acid dispersion of rosin (alcoholic rosin). This makes it possible to start off with the maximum amount of potential H ions. Of course, this is not

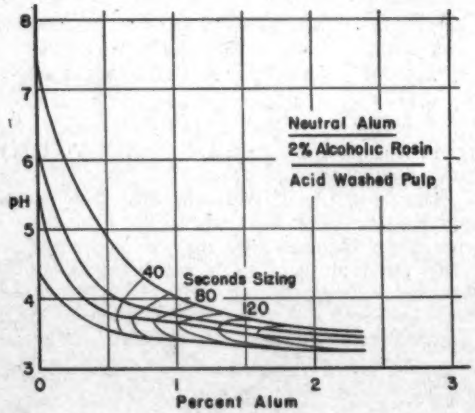

FIG. 1

as many as desired, but it represents the practical limit. Now any desired number of these potential H ions can be killed off with NaOH. In other words, a series of systems can be made involving identical amounts of Al_2O_3 and SO_4 but varying the number of available H ions. The ratio of Al_2O_3 and SO_4 can also be varied by making systems with regular neutral alum, a 33⅓% basic alum (which is a definite crystalline compound readily soluble in water), and with various mixtures of these two alums with sodium aluminate.

Experimental Data

After the data are obtained there are several ways they can be plotted. Figure 1 shows one method. An acid washed sulphite pulp is treated with 2% alcoholic rosin. The lower curve shows how the pH drops as various amounts of regular neutral alum are added. The other curves were made from the same pulp and rosin mixture except that NaOH in varying amounts was added to each beater before the alum was added. Points of equal ink penetration test are connected by the light lines which will be called iso-sizing lines. They are equivalent to contour lines on a map.

Now at any given alum dosage it can be seen that highest sizing occurs on the second line from the bottom. That is, on the bottom titration curve there are too many H ions present for optimum sizing and on the top two curves there are not enough H ions for optimum sizing. The more alum added the more SO_4 there is in the system and the lower the pH necessary for optimum sizing. This is just what would be predicted from the previous discussion. Results are carried out only to 2% alum. Variations are so rapid at higher alum dosage that it is impossible to plot them clearly. An instance of this is shown on Fig. 2. The only difference between various points on each curve is the amount of alkali originally in the beater. In no case was more alkali used than might normally be found in a beater.

Figure 3 is the same acid washed pulp and 2% alcoholic rosin. In this case the previously mentioned 30% basic alum was used instead of regular alum. This alum contains 50% more alumina per unit

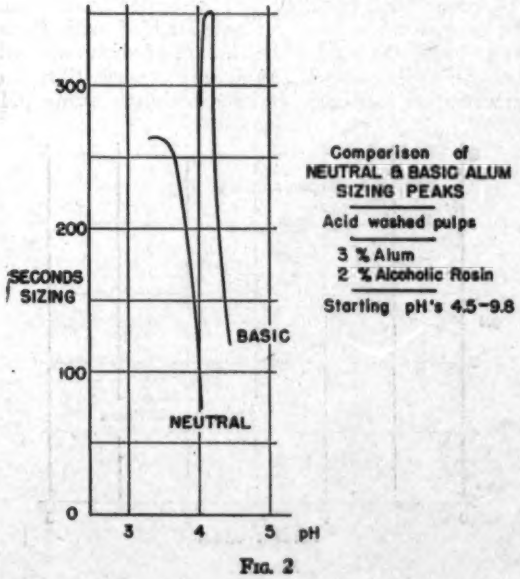

Fig. 2

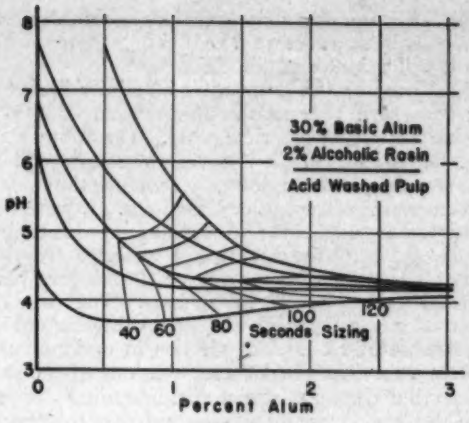

Fig. 3

weight of SO_4 than regular alum. The data are plotted on an alumina equivalent basis. That is, 1% alum means the same amount of alumina on both Figs. 1 and 3, but at any given amount of alum there is one third less SO_4 on Fig. 3 than on Fig. 1.

First notice that there is the same type system except that optimum conditions are from ¾ to 1 pH higher on the high basic alum than on the regular alum. As expected, by cutting the amount of SO_4 in the system without reducing the alumina the pH has been raised for maximum aluminum ion concentration and maximum sizing. Notice that on the bottom titration curve where there are the most H ions available from the pulp and rosin the pH actually rises as the alum dosage is increased. This would seem to be evidence of the fact that H ions are reacting with hydrated alumina. That the result of this reaction is Al ions is indicated by the fact that sizing is increasing.

Just to show that optimum pH is higher with high basic alum because of the absence of SO_4 rather than because of the free alumina, the same experiment with a 30% basic alum made by adding NaOH to regular alum can be run. This alum is 30% basic, but contains as Na_2SO_4 just the same amount of SO_4 per unit of alumina as regular alum. Figure 4 shows the results. Without adding acid which would of course change the Al_2O_3/SO_4 ratio and therefore spoil the experiment, it was not possible to get down to optimum pH. However, it is obvious that optimum pH is considerably below optimum for the true basic alum and at least very near that for regular alum. In other words, it is fairly evident that optimum pH depends upon the amount of SO_4 in the system, and not upon the basicity of the alum used. Since low SO_4 concentration is necessary to raise the optimum sizing pH it is easy to understand why sizing at high pH is considerably better with a combination of alum and sodium aluminate than with alum and any other alkali.

If the basic theory is correct the chloride ion should be just as detrimental to high pH sizing as the sulphate ion. Figure 5 was made using $AlCl_3$ in place of regular alum. It is evident that optimum pH is in the same place regardless of whether the alumina is combined with chloride or sulphate.

Since the chloride ion apparently has the same effect on sizing as the SO_4 ion and it is much easier to make a highly basic alumina sol with the chloride, a series of sizing runs were made with such a sol. Figure 6 was made with an 86% basic alumina sol.

In this case, the titration curves are practically horizontal. This sol does not keep well. After a few days it will not size at all.

It has been shown that beater alkalinity is a nuisance because it necessitates the addition of SO_4 to get down to optimum sizing pH. The more alkali present the more SO_4 it is necessary to add and the more that is added the lower becomes optimum pH. In papermaking tremendous volumes of water are involved. Large amounts of H ion are needed to drop the pH of these large volumes of water. As the pH scale is logarithmic, a change of 3 pH involves a thousand fold increase in H ions. The principal source of H ions must be accompanied by an equivalent amount of SO_4. A 3 pH rise in optimum then involves a thousand fold decrease in one of the principal H ion demands and a corresponding decrease in SO_4 added. As these effects work together it should not be difficult to attain a 3 pH rise in optimum. It is easy to attain with a mixture of alum and sodium aluminate. The 30% high basic alum is particularly advantageous because one-third of the alumina present is free from SO_4. This free alumina is better than that in sodium aluminate because the latter is necessarily accompanied by its quota of deleterious alkali.

Because of the decreased H ion demand what is desired to show can be shown without acid washing the pulp. The following plates are therefore marked "pulp as is." Alcoholic rosin was used to avoid a possible variable in type of size.

Figure 7 shows three cases of alum-sodium aluminate mixtures. The first hump in each horizontal group is for 1% alum. The second hump is a mixture of 1% alum and 1% alum equivalent of sodium aluminate. The third hump is 1% alum, 2% aluminate. The bottom row was made with 30% basic alum and the middle row with regular alum. Notice that optimum pH is higher with basic alum on each hump. The top horizontal row was made with 3% rosin and basic alum instead of 2% rosin as in the other cases.

The method of plotting results used in these last three sodium aluminate plates illustrates the principles described very nicely. However, the type of plot previously used is much more illuminating in pointing out the proper way to use sodium aluminate. Figure 8 is from the same data as one case on Fig. 7, namely an unwashed pulp, 2% alcoholic rosin and 1% of 30% basic alum with varying amounts of sodium aluminate.

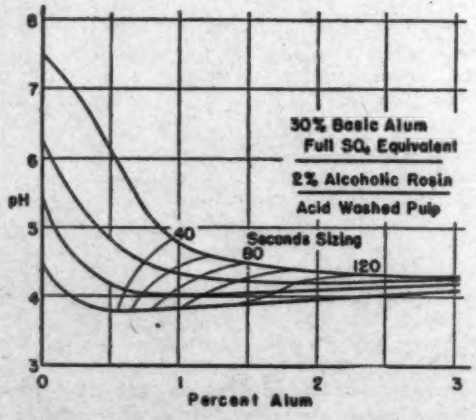

Fig. 4

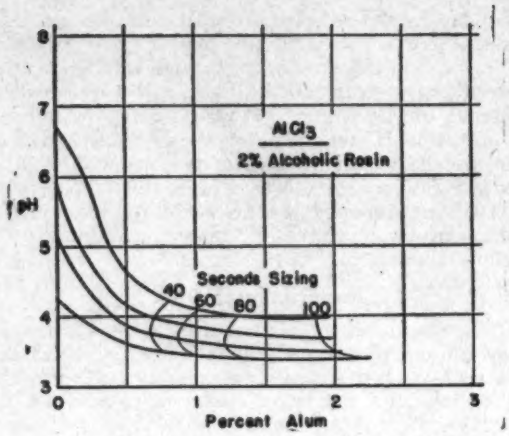

Fig. 5

On this plot, the titration curves can be seen which must be followed if alum is added followed by sodium aluminate. This is the usual procedure in mill operation. Obviously, the more iso-sizing lines which are cut with the titration curve, the higher the efficiency. In this particular case, the line starting at 4.7 pH with 1% alum is best. Any titration curve above or below this line decreases in efficiency as the distance increases until finally no benefit is derived. The initial alum dosage can be varied. This does not change the general shape of the figure made by the iso-sizing lines. It does, however, change their length, value, and slope. Sizing ceases around 9 pH, therefore the less alum used at the start the higher the pH and the faster it climbs with any given addition of aluminate. The iso-sizing lines are therefore shorter and steeper. If a start is made with more alum, the initial pH is lower and the pH rise slower per unit of aluminate added. The iso-sizing lines are longer and less steep.

Use of Sodium Aluminate

Data have been presented showing that the presence of too much SO_4 ion or other anions in a paper furnish is detrimental when high pH sizing against writing ink is desired.

SO_4 ions are introduced into the beater from alum. The greater the amount of alkali added with rosin size and pulp the greater the amount of alum required to obtain a desired pH. As alum increases, SO_4 ion concentration increases, and the optimum sizing pH

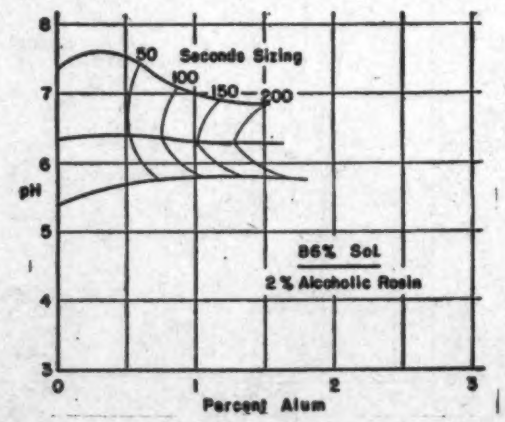

Fig. 6

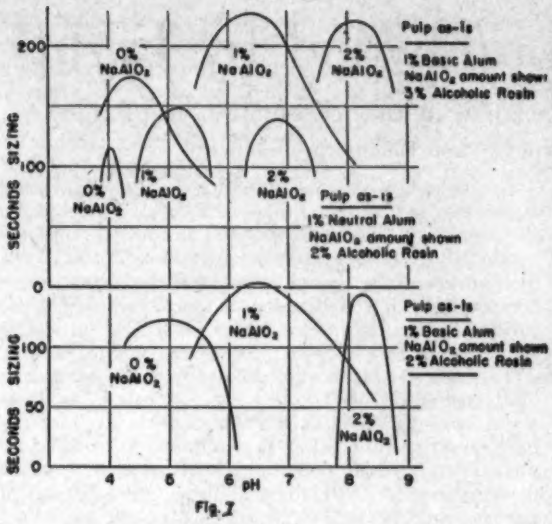

FIG. 7

is lowered. When optimum sizing pH is low considerable alum is required to lower the pH of the large volumes of water used in the papermaking process. Sizing at high pH is desired, to eliminate the necessity of lowering the pH of large volumes of water, to produce more permanent paper, and to reduce the corrosion of the paper machine equipment.

Since maximum sizing at high pH is obtained only with a low SO_4 ion concentration, a high basic alum is required. A high basic alum made with alum and caustic soda or soda ash is of no benefit since it still contains just as much SO_4 ion as the original alum. A combination of alum and sodium aluminate, however, does meet the requirements of a truly basic alum in which the SO_4/Al_2O_3 ratio can be lowered to any desired point. A hypothetical example may make this more clear. A mill is using 2% rosin, 3.1% alum and 0.875% of caustic soda to bring the pH up to 6.0. The basicity (based on Al_2O_3/SO_4 ratio) of this alum is 4%, the same as it was before the caustic soda was added. The same pH and alumina concentration can be obtained with 1.5% alum and

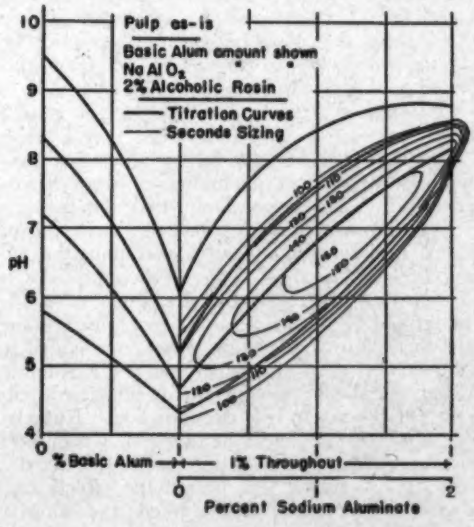

FIG. 8

0.5% sodium aluminate but this mixture is 53.5% basic. The difference in the amount of SO_4 introduced in to the system is considerable. The use of 3.1% alum and 0.875% caustic soda adds 43.2 pounds of sodium sulphate for every ton of paper produced whereas the use of 1.5% alum and 0.5% sodium aluminate adds only 20.8 pounds of sodium sulphate per ton of paper.

Conclusions

Sizing at a pH of 6 or 7 just as hard as that obtained at 4 pH is possible in the laboratory. Although this ultimate is not possible in practice with existing commercially available material, the proper use of pulp, rosin size, alum, and sodium aluminate makes it possible to accomplish considerable in this direction.

New TAPPI Members

Donald W. Davis, Director of Research, Converted Products Division, Marathon Corporation, Menasha, Wis., a 1931 graduate of the University of Illinois.

Louis E. DeLauter, Paper Technician, Curtis Publishing Co., Philadelphia, Pa.

John J. Graham, Technical Assistant to General Superintendent, Associated Pulp & Paper Mills Limited, Burnia, Tasmania.

Arnold W. Kaplan, Student, New York State College of Forestry, Syracuse University, Syracuse, New York.

James R. Lyon, Chief Chemist, Kenray Company, 3020 West Clarke St., Milwaukee, Wis., a 1935 graduate of New York State College of Forestry.

John G. Meiler, Director, Plywood Research Foundation, Tacoma, Wash., a 1930 graduate of the University of Chicago.

Jaime M. Ortiz, Post-Graduate Student, New York State College of Forestry, Syracuse University, Syracuse, N. Y. Facultad de Ciencias Quimicas (Mexico).

Franklin H. Price, Librarian, The Free Library of Philadelphia, Philadelphia, Pa.

Leo J. Rampel, President and Owner, Rampel Chemical Co., 140 East 3rd St., Mt. Vernon, N. Y., a 1913 graduate of Louvain College.

George E. Scofield, Chief Chemist, Rayonier, Inc., Fernandina, Florida, a 1936 graduate of the University of Washington.

Miss Eleanor G. Sheridan, Junior Research Chemist, Container Corporation of America, a 1941 graduate of the University of Illinois.

William R. Traill, Chief Chemist, Reed & Smith, Papermakers, Silverton Mills, Hele, Exeter, England, a graduate of the Heriot-Watt College, Edinburgh, Scotland.

Syracuse Offers Short Courses

A short course in lumber grading and a short course in dry kiln practice has been announced by The New York State College of Forestry for September and October. The dates for the lumber grading course—September 24 and 28 inclusive; for the dry kiln practice course, October 1 to October 10. This arrangement makes it possible for those who desire to take both courses to do so without two trips to Syracuse, as the dry kiln course will follow immediately after the lumber grading ends.

A certificate will be given by the College to each person passing the course. No previous training or experience is required.

The "Fading" of Groundwood by Light*

I. A Study of the Relation Between the Variables in Sheet Formation and Fading

By Harry F. Lewis[1], Edward A. Reineck[2], and Douglas Fronmuller[3]

Abstract

A preliminary study has been made of some of the variables in a groundwood sheet which will influence the rate of fading for the purpose of establishing the secondary effect of such variables in the overall fading of groundwood sheets. Among these were the fading effectiveness of the light of the carbon-arc Fade-Ometer, the effect of a variation in source and quality of the groundwood, the relative influence of heat and light, the effect of variations in the technique of handsheet formation, the effect of the presence of sulphite in the furnish, and the relation between the pH of the groundwood sheet and the rate of color change. The detailed results are given in the summary.

Historical Introduction

The color changes taking place on exposure of paper to light have long been a matter of interest and conjecture. At least two types of color changes have been recognized in the literature. The first is the "yellowing," which ultimately results from the exposure of almost any type of paper to light. This is particularly noticeable in old documents and in newspapers which have been exposed to the sun. The second change involves a true "whitening" of color; to this type of color change the term "fading" should be applied. Unfortunately, however, the use of these terms is rather thoroughly confused, and almost all types of color changes are commonly referred to as "fading." This is particularly true in the case of groundwood sheets, where the color change is very pronounced, both from the standpoint of speed of color formation and depth of color. There is no question but that the change which takes place in the groundwood sheet on exposure to light must be the result of an entirely different series of reactions than is the case with a sheet made from 100% rag stock or highly purified chemical wood pulp.

Very little technical information is to be found in the literature as to the cause and control of these color changes, and much of the work on the action of light on paper deals either with rag paper or with bleached sulphite sheets.

The problem of the discoloration of groundwood did not become prominent until the latter part of the nineteenth century. This was because of the fact that the first groundwood pulp in this country was made in 1867 and found its principal use as a filler. The amount of groundwood pulp and paper produced was not very large, and its uses were limited. Although the discoloration of groundwood was not immediately noticed, considerable attention has been given to the degradation of paper made from chemical pulps and rag pulps. An extended discussion of the action of ultraviolet light on cellulose will be found in Heuser's "The Chemistry of Cellulose," page 481-490 *(1)*.

In general, it may be said that light brings about a decrease in the strength of cellulose, a decrease in the degree of polymerization, and an increase in alkali solubility and copper number of the cellulose. The mechanism of the change is not entirely clear; among the products of the reaction are carbon dioxide and carbon monoxide. Cellulose is described as being converted to oxycellulose.

The most recent work on the subject has been done by Heuser and his co-workers, Stillings, Van Nostrand, and Chamberlin *(2, 3)*. These investigators have confirmed the belief that cellulose is affected by ultraviolet light in the absence of oxygen, because depolymerization of the cellulose with attendant changes in chemical constants is noted when the material is exposed to such light in atmospheres of either nitrogen or helium. Enhanced degradation results when irradiation occurs in the presence of oxygen. In addition to the direct degradation of the cellulose by light, there is a second effect—the glycosidic linkages of the cellulose are weakened to the point of being directly susceptible to attack by oxygen. This effect may be followed by irradiating the cellulose, estimating the changes brought about by the irradiation, storing the cellulose in oxygen for a period, and again estimating the secondary degradation. Irradiated cellulose stored in nitrogen shows no similar degradation during storage. The degradation of cellulose by ultraviolet light is accompanied by the formation of carbon monoxide and carbon dioxide. One molecule of each gas appears to be formed for each glycoside linkage severed. These gases, however, do not appear to result directly from the splitting of the glycosidic linkages.

Thus, the action of ultraviolet light on cellulose seems to follow two courses—the first is a splitting of glycoside linkages with the subsequent lowering of the degree of polymerization and an increase in copper number and alkali solubility. The second results in a weakening of the glycosidic linkages so that they are susceptible to further attack by oxygen alone. These authors show that the photochemical reaction which leads to a decrease in degree of polymerization is confined to the glycosidic linkages and possibly to the amylene oxide ring.

A divergence of opinion is to be found in regard to the groundwood degradation reaction. In 1897 Cross *(4)* stated that groundwood paper discolored very rapidly. He pointed out that paper prepared from groundwood was attacked by atmospheric oxygen, undergoing a veritable combustion of the lignocellulose. Evans *(5)* in 1898 confirmed Cross's statement that paper prepared from groundwood pulp disintegrated in the presence of oxygen. He further stated that the disintegration was accompanied by an alkaline reaction of the paper. In 1903 Klemm *(6)* introduced light as another factor which contributed to the discoloration of groundwood. Russell *(7)* stated that the chemical activity of wood surfaces could be shown by its action on a sensitized plate in the dark. During this period the effects of light and heat were more fully studied and some work appears to have been done with radium *(8)*. Radium emanations destroyed the strength of the paper; no mention was made of its discoloration.

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For a period of years, most of the investigations reported dealt with the storage problem of wet groundwood. The main storage problems were discoloration and degradation of the wet groundwood by molds and bacteria, since the high moisture content (60 to 80%) made groundwood lap an ideal medium for the growth of the microorganisms responsible for the discoloration.

Schoeller *(9)* in 1912 studied the relative discoloration of paper made from mechanical pulp, chemical pulp, and rag pulp. He stated that paper containing mechanical pulp discolored most rapidly, papers containing chemical pulp discolored to a smaller extent, whereas papers made from rag suffered only a slight discoloration. Herzberg *(10)* in 1918 stated that yellowing is not an oxidation, for the same effects occurred in nitrogen. He found that the discoloration was brought about by light and heat. Hitchins *(11)* in 1918, working with rag paper, also showed that yellowing is caused by light, moist heat, and dry heat; Bachelder *(12)* in 1919 pointed out that yellowing of cotton linters and bleached sulphite pulp is primarily caused by heat. In 1920 Aribert and Bouvier *(13)* concluded that yellowing of groundwood (impure lignocellulose) is caused by the oxidation of fats, waxes, resins, and lignin. They showed that light had a catalytic effect in breaking down the cellulose or some of the impurities present in paper. Sindall *(14)* in 1920 stated that yellowing of paper from mechanical pulp was a result of a slow oxidation of noncellulosic materials. Klemm *(15)* in 1921 attributed the yellowing of paper to the action of aniline vapors in printer's ink. However, in 1923 he *(16)* stated that yellowing is usually due to the oxygen of the air; other factors that contributed to the effect were heat and light.

In 1924 *(17)* it was shown that groundwood changes more or less rapidly in color, depending on the wood used. This was attributed to the effect of the air on the sap in the wood, since the action proceeded from the surface to the interior of the pulp. Pine, beech, birch, and alder changed in color in order given. Escourrou *(18)* studied the effect of the light from a quartz mercury vapor lamp on wood flour and groundwood and observed a severe degradation. Hoyer *(19)* in 1931 stated that the discoloration of groundwood pulp and paper is caused by several causes, chief of which were:

1. Kind of pulp—pine, beech, birch, and alder show the greatest change in color, and spruce, fir, larch, and aspen to a lesser extent. Maple and basswood do not show any change at all.
2. Iron.

Hoyer found no remedy for the discoloration of groundwood.

Hirschkind *(20)* in 1932 stated that the brown color or the discoloration of groundwood is caused by the transformation of the cell membranes into humus. Bakker *(21)* in 1937 found that the coloring matter produced by the illumination of groundwood paper by means of sunlight or an ultraviolet lamp was extracted by means of 0.5% ammonium hydroxide and was precipitated as a dark brown substance with hydrochloric acid. The composition of the precipitate was found to be 58.3% carbon and 4.8% hydrogen. When the substance was fused with potassium hydroxide, pyrocatechuic acid, pyrocatechol, and oxyhydroquinone were detected in addition to oxalic acid. The use of Kirschner's sublimation method at 220° C. yielded vanillic acid and a small quantity of vanillin. Bakker contended, therefore, that the yellowing of groundwood papers is due largely to the oxidation of lignin with the formation of humic acid. This is in accord with Hirschkind's deduction.

Schwalbe *(22)* in 1937 stated that fading was associated with a loss in carbohydrates. He proposed to add glucose to newsprint as a means of retarding its discoloration. Sandmo *(23)* in the same year pointed out that high-temperature grinding favored the removal of the soluble substances from wood. This treatment results in a more rapid yellowing of the pulp, especially under sunlight, followed by a decrease in the strength properties of the fiber.

Many articles dealing with the changes in color of the higher classes of papers stress two possible sources of color formation among the components of the paper: (1) A color formation resulting from the presence of iron compounds, rosin acids, and tannin. (2) The modification of the carbohydrates to yield more highly colored compounds.

In the case of the groundwood papers, it is possible that the color characteristics of the noncarbohydrate or carbohydrate fractions, or both, may change as the result of exposure to light. The conditions responsible for the color change, in addition to the action of light, are somewhat open to question. Many investigators, such as Klemm, Cross and Bevan, and others, believe that the change is caused by oxidation, and that the active oxidizing agent is the oxygen in the air. Herzberg *(10)* stated that the reaction may proceed in nitrogen as well as in oxygen and concluded that the reaction, therefore, is not necessarily one of oxidation. It would appear probable that the reaction is a photochemical effect dependent upon light and possibly upon heat, with atmospheric oxygen playing a minor role.

Because of the meagerness of the fundamental data and the uncertainty as to the conclusions to be drawn from those data, the Groundwood Association, on November 22, 1937, established a project at The Institute of Paper Chemistry which included a fundamental investigation of the causes and mechanism of the discoloration of groundwood and a study, based upon this fundamental work, of procedures which might be used to delay or prevent discoloration.

On the pages to follow the commonly used term "fading" will designate the discoloration occurring in groundwood on exposure to light.

Experimental Discussion

Before any exhaustive work could be carried out on the causes of the fading of groundwood, it seemed desirable to investigate the possible relation between color change and variables in sheet formation. Therefore, a considerable study was undertaken to develop information on the following points:

1. The effect of a variation in time of exposure of the groundwood sheet to the light of the carbon-arc Fade-Ometer.
2. The effect of variation in the source and quality of the groundwood.
3. The relative influence of heat and light on the change in color.
4. The effect of variations in the technique of handsheet formation.
5. The effect of the addition of sulphite pulp to the groundwood furnish on the rate of fading.
6. The relation between the pH of the groundwood sheet and its rate of color change.

The general procedure followed in making the sheets for test was as follows:

Sheets of commercially prepared groundwood wet

lap were torn apart and stored in air-tight tin cans lined with wax paper, and samples were withdrawn as desired. Handsheets were prepared by making a suspension of 1050 grams of wet lap in water (total volume, 17.5 liters) and disintegrating the mixture by stirring with a Lightnin' mixer. This stock suspension was diluted four times and 400 ml. were used to make a handsheet weighing 1.6 grams. About 100 such sheets were made at a time on the Valley sheet apparatus, pressed between paper blotters for 1 minute at 100 pounds, and finally dried between blotters for 15 minutes on the Williams drier.

The Atlas carbon-arc Fade-Ometer was used as the standard fading instrument for following the color change in these handsheets; in it, forty samples 2.75 by 3 inches) can be exposed at one time. In these exposures, the felt side of the sheet was placed so as to face the light of the Fade-Ometer.

Time of Exposure

Experiments were first carried out to determine the shortest exposure permissible for use in a standard testing procedure. Sixteen samples of the groundwood handsheets were put in the Fade-Ometer and exposed to the light for varying lengths of time, four samples being removed at the end of 1 hour, four at the end of 2 hours, another four at the end of 4 hours, and the last four after 8 hours. The changes in brightness of these handsheets as measured on the General Electric reflection meter are listed in Table I.

TABLE I.—CHANGES IN THE BRIGHTNESS OF GROUNDWOOD HANDSHEETS WITH VARYING TIMES OF EXPOSURE IN THE FADE-OMETER

Time of Aging, hr.	Brightness, %
Blank	61.7
1	56.7
2	54.8
4	51.6
8	45.3

It is apparent that the chief drop in brightness takes place rapidly; after 2 hours the color change is a straight-line function of the time of exposure. An exposure of 1 hour should be sufficient to determine the effect of a variable change or the effectiveness of an "antifading" material.

Selection of Groundwood for Use in All Experimental Work

A second series of tests was run in order to compare the first sample of groundwood with a groundwood of somewhat different quality obtained from another mill. Fresh handsheets were made from both pulps and fading tests were carried out over various time intervals. The relation between time of the fading treatment and the brightness of the exposed sheets are recorded in Table II.

TABLE II.—COMPARISON OF BRIGHTNESS CHANGES IN GROUNDWOOD FROM MILLS 1 AND 2

Time of Aging, hr.	Groundwood Mill 1, %	Groundwood Mill 2, %
Blank	61.3	57.6
1	55.9	54.1
2	52.4	51.8
4	48.9	47.1
6	...	44.0
8	...	41.7

It will be observed that, although the first pulp had a somewhat higher initial brightness, the brightness changes, after the rapid drop during the first time interval, follow more or less parallel lines. For this reason, it was decided to carry on all further routine tests with the groundwood from the first mill.

Relative Effect of Heat vs. Light in the Fading of Groundwood in the Fade-Ometer

A third preliminary series was run to determine whether the action of the Fade-Ometer involved changes caused by heat as well as by light. Handsheets prepared from both pulps were suspended in an oven in a circulating current of air at 100° C. for a period up to 8 hours. The changes in brightness of the two pulps as the result of heat aging are listed in Table III.

TABLE III.—CHANGES IN BRIGHTNESS OF GROUNDWOOD HANDSHEETS ON AGING IN A CURRENT OF AIR AT 100° C.

	Pulp 1		
Time of Aging, hr.	Series 1, %	Series 2, %	Pulp 2, %
Blank	62.0	61.3	56.9
1½	62.0	...	57.1
2	61.5	60.4	56.7
4	60.5	60.3	56.6
8	60.7	60.0	56.3

The surprisingly low changes in brightness on aging up to an 8-hour period would indicate that heat does not play an important part in the color change in handsheets aged in the Fade-Ometer up to 8 hours. It also suggests that a temperature of 100° C. for 8 hours will not greatly accelerate the degradation as measured by a color change.

Variations in Handsheet Formation

Another point to be determined in establishing a standard fading test was the effect of the usual variations in the composition of the handsheets and of variations in the intensity of the light in the different sections of the Fade-Ometer. In order to find out what differences might be expected in a series of handsheets made one after the other from the same batch of stock, nine different sheets prepared from the same beater of pulp were exposed at the same time in the Fade-Ometer for 1 hour. The original brightness of these nine sheets was between 58.9 and 60.0%, a spread of 1.1%. The brightness of the aged sheets ranged from 53.4 to 54.5%, also a variation of 1.1%. The greatest drop in brightness on aging was 5.8% and the smallest drop was 5.0%, or a variation of 0.8%. These are the variations that might normally be expected in a series of check determinations. In order to be significant, differences must not fall within these values.

Effect of the Addition of Sulphite to Groundwood

Inasmuch as most commercial groundwood sheets are furnished with sulphite pulp, a brief study was made of the possible effect of the addition of bleached and unbleached sulphite on the rate of color change.

The first series was run in the Fade-Ometer for 16 hours. Five samples were investigated, having the following furnishes: 100% groundwood, 100% unbleached sulphite, 60% groundwood—40% unbleached sulphite, 60% groundwood—40% bleached sulphite, and 40% groundwood—60% bleached sulphite. The brightness values for these sheets before and after exposure are indicated in Table IV.

TABLE IV.—THE LOSS IN BRIGHTNESS ON 16-HOURS EXPOSURE TO THE FADE-OMETER OF GROUNDWOOD AND GROUNDWOOD-SULPHITE SHEETS

Furnish	Brightness Before Aging, %	Brightness After Aging, %	Points Drop
100% Groundwood	56.3	31.8	24.5
100% Unbleached sulphite	55.1	47.0	8.1
60% GW—40% unbleached sulphite	51.0	33.7	17.4
60% GW—40% bleached sulphite	61.5	36.6	24.9
40% GW—60% bleached sulphite	64.1	42.9	21.2

Surprisingly enough, the addition of bleached sulphite to the groundwood in the amounts specified seemed to affect very little the rate of fading; the loss of brightness for 100% groundwood and for 60% groundwood—40% bleached sulphite is the same,

namely, 24 to 25%. Unbleached sulphite on the other hand, acts more nearly as might be expected. Whereas 100% groundwood loses 24.5 points on 16-hour exposure, 100% unbleached sulphite loses but 8.1 points, and a 60% groundwood—40% unbleached sulphite loses 17.4 points.

Because of the unexpected behavior of the groundwood-bleached sulphite mixtures, a somewhat more detailed series of tests was carried out in which sheets of six furnishes were exposed to sunlight. The six furnishes were as follows: 100% bleached sulphite, 20% groundwood—80% bleached sulphite, 40% groundwood—60% bleached sulphite, 60% groundwood—40% bleached sulphite, 80% groundwood—20% bleached sulphite, and 100% groundwood. These sheets were exposed to sunlight for 5, 20, and 35 hours and the brightness determinations made before and after exposure. The results of the tests are shown in Table V. Comparative results on 100% unbleached sulphite are included.

TABLE V.—THE LOSS IN BRIGHTNESS ON EXPOSURE TO SUNLIGHT OF GROUNDWOOD—BLEACHED SULPHITE SHEETS

GW—groundwood; BS—bleached sulphite; UBS—unbleached sulphite

Furnish	Original, %	After 5 hr., %	After 20 hr., %	After 35 hr., %	Points Drop
100% BS	77.9	74.5	73.0	70.7	7.2
80% BS—20% GW	70.0	64.6	56.9	52.2	17.8
60% BS—40% GW	65.2	59.5	52.6	47.5	17.7
40% BS—60% GW	62.0	56.2	47.5	40.5	21.5
20% BS—80% GW	58.3	54.2	45.9	38.5	19.8
100% GW	56.9	52.5	41.2	35.8	21.1
100% UBS	56.8	52.3	50.2	45.5	11.3

A comparison of the fading data with the one-component sheets (See Fig. 1) again shows that the bleached sulphite with its high initial brightness also fades at the slowest rate; unbleached sulphite and groundwood, in contrast, have the same initial brightness and the same brightness after 5-hour exposure, but from that point on, the groundwood fades much more rapidly than does the unbleached chemical pulp.

The effect of this difference is reflected in the brightness values of the mixed groundwood—bleached sulphite handsheets. These data have been averaged graphically in Fig. 2. In this it is seen that the curve for the sheets exposed for 35 hours falls away more rapidly as the percentage of groundwood increases in the furnish than does the curve for the unaged sheets. The actual drop in brightness for the 100% bleached sulphite sheets on exposure is 7.2 points; for the 100% groundwood, 21.1 points. Furnishes containing 20 and 40% bleached sulphite, respectively, seem to lose about as much as do the 100% groundwood furnishes. Bleached sulphite added to groundwood in amounts up to 40% brightens the sheet but

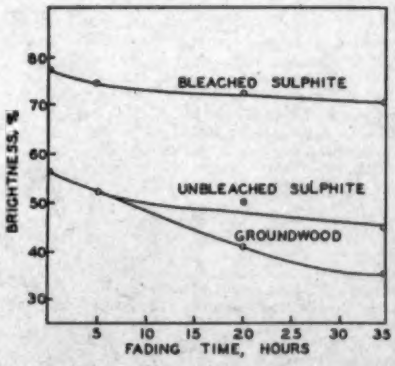

FIG. 1

Comparison of Fading of Groundwood, Unbleached Sulphite, and Bleached Sulphite on Exposure to Sunlight

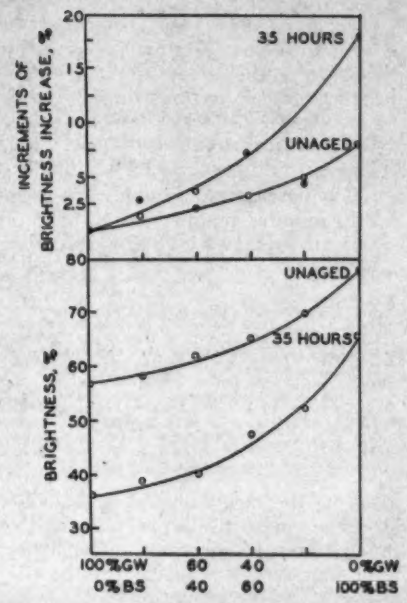

FIG. 2

Effect of a Variation in the Relative Groundwood-Bleached Sulphite Furnish on the Brightness of Sheets Before and After Exposure to Sunlight

does not improve its relative resistance to fading. On the other hand, groundwood added to bleached sulphite to the extent of 20% of the furnish, affects to a marked degree the fading behavior of the furnish.

Effect of Variation in pH on the Rate of Fading

One of the variables in sheetmaking which appeared to be of importance in a study of the fading of groundwood was that of the acidity of the sheet. Two series of experiments were therefore set up for the purpose of measuring this effect.

In the first, groundwood handsheets were treated with various acids, bases, and salts such as tartaric, acetic, and boric acids, and sodium bicarbonate and borax, using 0.5 and 0.1% of the reagents on the weight of the sheets.

The changes in brightness as the result of a 1-hour exposure to the Fade-Ometer are listed in Table VI.

TABLE VI.—THE EFFECT OF ACID AND ALKALINE REAGENTS ON THE RATE OF FADING OF GROUNDWOOD HANDSHEETS

Reagent	Brightness: Before Exposure, %	Brightness: After 1-Hour Exposure, %	Drop
Blank	60.5	54.5	6.0
0.5% tartaric acid	62.9	55.6	7.3
0.5% acetic acid	60.3	53.1	7.2
0.5% boric acid	61.9	48.6	13.3
0.1% tartaric acid	62.6	55.4	7.2
0.1% acetic acid	60.5	54.1	6.4
0.1% sodium bicarbonate	59.4	52.4	7.0
0.1% borax	60.5	54.2	6.3
0.5% sodium bicarbonate	56.8	53.0	3.8
0.5% borax	59.4	53.3	6.1

Inasmuch as no attempt was made in this first preliminary experiment to estimate the pH of the sheet, a second series was set up at a somewhat later date, in which varying amounts of sulphuric acid (H_2SO_4) and sodium hydroxide (NaOH) were used to control the pH; in every case the actual pH of the water extract of each sheet was determined.

The procedure used was as follows: A quantity of western spruce groundwood was screened to free the pulp of shives, etc., and sufficient pulp suspension

was then taken to make a 1.6-gram sheet on a 6.25-6.25-inch sheet mold. The wet sheets were couched from the wire with clean blotting paper and pressed at 100 pounds pressure for approximately 1 minute. The usual precautions in preparing the sheets for brightness testing were observed, such as drying between blotters to insure uniformity in brightness. About 50 sheets were prepared in this manner.

On the following day four groundwood sheets were dipped for 10 minutes in each one of the following solutions and air-dried while suspended from small hooks.

1% H_2SO_4	29.75 ml. of 28% H_2SO_4 per liter
0.5% H_2SO_4	500 ml. of 1% H_2SO_4 + 500 ml. H_2O
0.05% H_2SO_4	25 ml. of 1% H_2SO_4 per 500 ml. solution
0.01% H_2SO_4	5 ml. of 1% H_2SO_4 per 500 ml. solution
0.005% H_2SO_4	2.5 ml. of 1% H_2SO_4 per 500 ml. solution
0.001% H_2SO_4	0.5 ml. of 1% H_2SO_4 per 500 ml. solution
Blank	Groundwood sheet as made with tap water
0.001% NaOH	1 ml. of 0.5% NaOH per 500 ml. solution
0.005% NaOH	5 ml. of 0.5% NaOH per 500 ml. solution
0.01% NaOH	10 ml. of 0.5% NaOH per 500 ml. solution
0.05% NaOH	50 ml. of 0.5% NaOH per 500 ml. solution
0.5% NaOH	500 ml. of 0.5% NaOH

After air-drying the sheets dipped in the above solutions, they were cut to the proper size and exposed in the Fade-Ometer for 6 hours. The material not required for exposure was tested for the pH of its water extract. The brightness of the faded and unfaded samples was determined. The results are given in Table VII.

TABLE VII.—EFFECT OF VARIATION IN pH ON THE RATE OF FADING OF GROUNDWOOD SHEETS IN THE FADE-OMETER

Impregnating Agent	pH of Water Extract	Brightness: Unfaded Samples, %	Brightness: Faded Samples, %	Drop in Brightness on Fading 6 hr.
1% H_2SO_4	2.10	51.6	29.0	22.6
0.5% H_2SO_4	2.46	52.4	36.1	16.3
0.05% H_2SO_4	3.39	55.4	42.4	12.9
0.01% H_2SO_4	4.21	54.4	41.8	12.6
0.005% H_2SO_4	4.42	53.6	42.0	11.6
0.001% H_2SO_4	4.40	53.5	42.5	11.0
Blank	6.59	52.4	42.3	10.2
0.001% NaOH	6.30	52.5	40.5	12.0
0.005% NaOH	7.60	51.8	40.0	11.8
0.01% NaOH	7.95	49.5	40.7	8.8
0.05% NaOH	8.10	45.4	38.8	6.6
0.5% NaOH	9.88	39.8	28.8	11.1

As will be seen from the data in Table VII and from Fig. 3, the original brightness of a groundwood sheet, as well as its brightness after fading, is greatly influenced by the pH of the sheet. Other things being equal, the point of maximum brightness for both unexposed and faded sheets is in the pH range of 3.0 to 4.5. On either side of this area, the brightness falls away—on the acid side with considerable acceleration. The brightness of the unfaded sheets is much lower at 9.9 than at 2.1; the faded sheets at these two pH values have the same and lowest brightness.

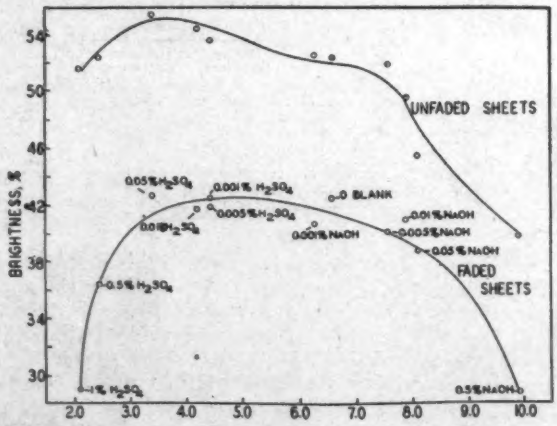

FIG. 3
Relation Between pH and Brightness of Faded and Unfaded Groundwood Sheets

Summary

1. The chief drop in brightness of a groundwood sheet occurs during the first hour of exposure. After the second hour, the color change is a straight-line function of the time of exposure. One-hour exposure is therefore sufficient for observing the effectiveness of a treatment or variable change.

2. Pulps from different mills have different original brightness values and show color changes under identical conditions which vary in degree and slope. For future work, groundwood pulp from one source was selected.

3. A temperature of 100° C. in the absence of light results in only minor changes in brightness. Light is a much more effective cause of fading.

4. Brightness variations of about 1 point on the General Electric reflection meter can be expected in groundwood sheets made in series from the same furnish. To be significant differences must therefore be greater than one point.

5. Bleached sulphite in a groundwood furnish affects the rate of fading only slightly. No difference in rate is noted between 100% of groundwood and 60% groundwood—40% bleached sulphite. On the other hand, unbleached sulphite behaves more nearly as would be expected from the fading rates of the two pulps. Exposure to sunlight gave different results—the bleached sulphite fading at the slowest rate whereas unbleached sulphite and groundwood of the same initial brightness and same faded brightness at 5-hour exposure began to show a different action after that time with groundwood fading much more rapidly than unbleached sulphite.

6. The original brightness of a groundwood sheet, as well as its brightness after fading, is greatly influenced by the pH of the sheet. Other things equal, the pH range of maximum brightness for unexposed and faded sheets is 3.0 to 4.5.

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ARE YOU INTERESTED IN—

Controlled particle size and settling rates for lime, by method of reburning and slaking?

Write us making appointment to have a talk with our engineer.

TRAYLOR

ENGINEERING & MANUFACTURING CO.
MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

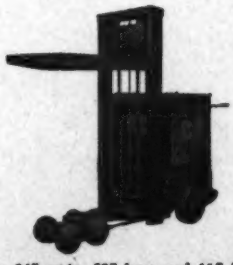
WRIGHT-HIBBARD

INDUSTRIAL ELECTRIC TRUCK CO.
INCORPORATED
Phelps, New York

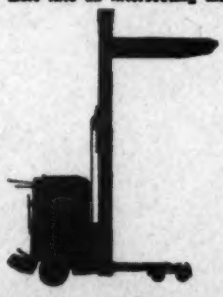
Platform size 24 x 42 x 11" high, low position; 15" high when elevated. Capacity: 2000, 3000, and 4000 pounds.

Capacity 2000 lbs. on forks 30" long. Truck turns from a 5' aisle into an intersecting aisle of 5'.

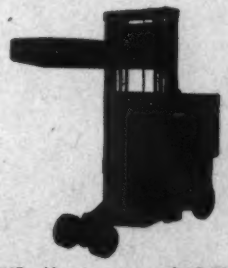
Weight of 4000 lbs. capacity—2830, without battery. Truck turns from a 5' 6" aisle into an intersecting aisle of 6'.



Platform 24" wide, 53" long and 11" high, low position. Capacity 2000, 3000 and 4000 pounds.



The Wright-Hibbard Telescoping high lift truck is designed to operate in the most congested areas of factories and warehouses. The exceptionally narrow width and short overall length found in other Wright-Hibbard trucks are retained in this model.



Platform 24" wide, 44" long and 9" high, low position. Weight of 4000 lb. capacity—3200 without battery.

New York Paper and Pulp Market Review

Paper Output Expected To Continue With Slightly Expanding Operations In First Post-War Months With Newsprint Scarce — Wood Pulp Supply Improving—Waste Paper Salvaging Continues.

Office of the PAPER TRADE JOURNAL,
Wednesday, August 22, 1945.

Paper production is expected to continue with slightly expanding operations now that the industry has entered the post-war reconversion period. About forty wartime restrictions will remain for awhile but a gradual improvement is widely expected to materialize.

Most types of paper, excepting newsprint, should become available in increasing amounts for normal uses. Inventories are very low, however, and substantial tonnage is required to build up stocks to the most economical peacetime level. The outlook for the paper industry is excellent.

The index of general business activity for the week ended August 11 declined to 137.9, from 139.1 in the preceding week, compared with 157.3 for the corresponding week in 1944. The index of paperboard production was 151.9, compared with 152.5 for the previous week, and with 107.7 for the corresponding week in 1944.

Paper production for the week ended August 11 was estimated at 90.6%, compared with 91.2% in 1944, with 92.4% for 1943, with 77.5% for 1942, and with 99.0% for the corresponding week in 1944.

Paperboard production for the week ended August 11 was 93.0%, compared with 96.0% for 1944, with 98.0% for 1943, with 73.0% for 1942, and with 92.0% for the corresponding week in 1941.

Production of paper and allied products in the first full year of the post-war era is estimated by the Committee for Economic Development to rise from a value of $2,019,500,000 in 1939, to $2,579,300,000 in the post-war year, an increase of 27.7%. This statistical increase is, of course, about the maximum that can be predicted and can only be attained providing all elements can be arranged to the most favorable extent. Much less, about 10%, is rather widely estimated in most quarters.

Wood Pulp

Somewhat less wood pulp than had been estimated was received from Sweden but the shipping situation is slowly improving and so is the acute coal situation. Cumulate pulp imports through July 27 totaled 22,753 tons, consisting of 8,155 tons of unbleached sulphite; 11,517 tons of unbleached sulphate; 728 tons of bleached sulphite other than rayon and chemical grades; 2,230 tons of bleached sulphite and special grades; and 123 tons of bleached sulphate. If the estimated 400,000 tons can be attained this year, that total will be very substantially higher than the amount expected in most quarters.

Rags

Mill receipts of cotton rags in the first half of 1945 totaled 193,000 tons, compared with 224,000 tons in 1944, a decrease of 13.8%. Consumption in the half yearly period was 210,000 tons, compared with 219,000 tons in 1944, a decrease of 4.1%. Inventories totaled 61,000 tons at the close of the half-year period, compared with 74,000 tons in 1944, a decrease of 17.8%.

Mill demand for cotton cuttings is reported active this week. Prices are strong at ceiling levels, under the influence of relative limited supplies.

Demand for old cotton rags continues steady. Old whites and blues are currently in active demand. Prices are firm at ceiling levels.

Old Rope and Bagging

Demand for old Manila rope continues active. No important change in quotations or supply has been reported this week.

No definite change in the limited buying of scrap bagging has been reported at this date. Scrap grades are characterized as slow. Trading in No. 1 gunny is reported fair. Prices are unchanged.

Old Waste Paper

Mill receipts of paper stock for the half-year period in 1945 totaled 3,532,000 tons, compared with 3,540,000 tons in 1944, a decline of 0.2%; consumption, 3,519,000 tons, compared with 3,498,000 tons in 1944, a decrease of 4.1%, while inventories totaled 324,000 tons, compared with 289,000 tons in 1944, an increase of 12.1%.

Publishers Use More Newsprint

Daily newspapers reporting to the American Newspaper Publishers Association consumed 177,905 tons of newsprint paper in July, 1945, compared with 174,866 tons in 1944 and 215,012 tons in 1941. This was an increase in July, 1945, over July, 1944, of 1.7% and a decrease under July, 1941, of 17.3%. The year 1941 is the base for calculating allowable use by newspapers.

The total estimated newsprint consumption in the United States for July, 1945, was 254,150 tons which includes all kinds of uses of newsprint paper. For the first seven months of 1945, it was estimated to be 1,915,006 tons.

During the first seven months of 1945 the reporting newspapers used 1,340,504 tons of newsprint, a decrease of 0.2% under the first seven months of 1944 and a decrease of 20.3% under the first seven months of 1941.

Stocks of newsprint paper on hand with newspapers reporting to the ANPA were 54 days' supply at the end of July, 1945, which was an increase of 9 days' supply from 45 days on hand at the end of June, 1945.

Continental Announces Promotions

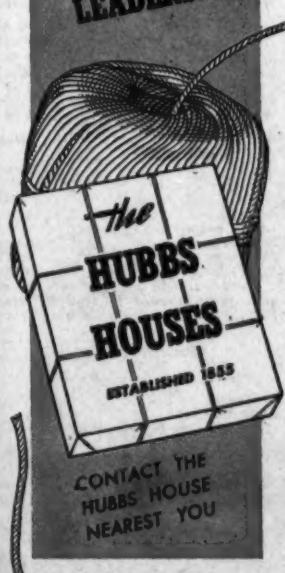
RIDGEFIELD PARK, N. J., August 21, 1945—W. J. Alford, Jr., president of the Continental Paper Company, today announced the following promotions: W. J. Alford, 3rd, becomes assistant to the president; A. P. Manogue is made vice-president and general superintendent; A. E. Mazes becomes vice-president in charge of purchases. Mr. Mazes will continue to handle the purchasing of waste paper as in the past two years.

MILL OWNER:
"NOW I CAN READ EVERY WORD . . . . AND IT LOOKS GOOD TO ME"

Yes, Mr. Mill Owner and Mr. Converter, it is easy to see how the fortunate locations of the Hubbs Houses and the thousands of contacts our salesmen make with regularity, can place your products before the *important buyers* . . . . quickly, economically and successfully.

We are doing it for others . . . . we can do it for you! Think how it will simplify your selling from Indiana east. Let us explain how we operate . . . . no obligation. Contact the Hubbs House nearest you.

FOR A
DISTRIBUTORSHIP
THAT MEANS
LEADERSHIP



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CANADIAN VEGETABLE PARCHMENT CO., LTD.
MERRITTON, ONT.

WAREHOUSES AT ALL THE ABOVE.

PARIS 2

The **BLACK** *for* **PAPER**

• A COLUMBIAN COLLOID •

Especially created to overcome dispersion problems, Paris 2 is the easiest wetting black in the paper field.

- ✔ Free from oiliness
- ✔ Optimum particle size
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Use
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for
JET BLACK PAPERS
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Technical Inquiry Is Invited

COLUMBIAN CARBON CO. • MANUFACTURER
BINNEY & SMITH CO. • DISTRIBUTOR
41 EAST 42nd STREET • NEW YORK 17, N. Y.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, August 22, 1945.

BLANC FIXE—Prices on blanc fixe continue unchanged at prevailing levels. Demand is reported fair. The pulp is quoted at $40 per ton, in barrels, at works. The powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—All-over demand continues heavy. Production reported high. Allocation removed on February 27. Quotations are unchanged. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more 24 cents per pound; 2,000 pounds, 24½ cents per pound, less than 2,000 pounds, 24¾ cents per pound f.o.b. shipping point. Imported 21 to 23 cents.

CAUSTIC SODA—Demand very heavy. Production large, but under demand. Market tight. Shipments a little delayed by lack of manpower. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CHINA CLAY—Current demand is reported moderate on many grades of china clay. Quotations unchanged. Domestic filler clay is quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, shipside.

CHLORINE—Military and all essential requirements heavy. April output lower at 103,478 tons. Paper allocated 46,284 tons. Chlorine is currently quoted at $1.75 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—Offerings and sales light. The OPA price on "G" gum rosin is $6.74 per 100 pounds in barrels, at Savannah. "FF" rosin is established quoted at $6.70 per 100 pounds, in barrels at New York. Average price on seventy per cent gum rosin size is $6.95 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake continue to be reported unchanged. Domestic salt cake is currently quoted at $15 per ton, in bulk. Chrome cake is currently quoted at $16 per ton. All quoted prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand for soda ash is reported to absorb current production. Market still is tight. Prices continue to conform to prevailing levels. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Corn market is reported steady. Offerings fair at this date. Demand heavy. Prices unchanged on starch. Pearl is quoted at $3.72 per 100 pounds. Powdered starch is quoted at $3.83 per 100 pounds. All prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand good. Supply situation is favorable. Prices of the commercial grades are currently quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.75 per 100 pounds. All prices in bags, car lots, f.o.b. works.

SULPHUR—Current consumption of sulphur continues heavy. Market situation unchanged. The quotation on Annual contracts continues at $16 per long ton, f.o.b. mines. The current price on contracts at Gulf Ports is $17.50 per long ton.

TALC—Demand reported good. Domestic grades are currently quoted at from $16 to $21 per ton at mines. Canadian at $24 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$61.00	●	—
Sheets	69.00	●	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Superstandard Wrapping	*$5.25	●	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	●	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*50.00	●	—
Chip	*50.00	"	—
Sgl. Mla. Lt. Chip	*62.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10	@$46.00	$40.25	@$47.25
100% Rag	32.20 "	37.75	33.35 "	39.25
85% Rag	.... "	....	29.90 "	35.00
75% Rag	23.00 "	27.00	24.15 "	28.25
65% Rag	.... "	....	22.80 "	27.75
50% Rag	18.70 "	22.75	19.90 "	24.25
25% Rag	16.40 "	20.00	17.55 "	21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$10.55	@$12.75	$11.70	@$14.25
No. 2	9.65 "	11.75	10.80 "	13.25
No. 3	9.20 "	11.25	10.35 "	12.50
No. 4	8.90 "	10.75	10.05 "	12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$15.50
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.25
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$86.00
Unbl. Softwood Sulphite	74.00
Bl. Hardwood Sulphite	83.50
Unbl. Hardwood Sulphite	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich ..72.00 ●	82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	72.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	●	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

*OPA Maximum Prices

West Virginia Pulp and Paper Company

230 Park Ave.
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35 East Wacker Drive
Chicago

Public Ledger Building
Philadelphia, Pa.

503 Market St.
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Manufacturers of

ENGLISH FINISH BOOK
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and LITHOGRAPHIC PAPERS

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HIGH GRADE COATED BOOK

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KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:

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Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Charleston, South Carolina

"A small drop of ink falling like dew upon a thought produces that which makes thousands, perhaps millions think."
—LORD BYRON

IT is in the spirit of this quotation that we at Lindsay have woven wire cloth for more than 40 years. We believe that no so-called detail is too small to demand careful attention.

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Serving the Paper Industry Since 1903
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WOOD PULP & PAPER AGENTS

for domestic and export

60 East 42nd Street, New York 17, N.Y.

WAR is Our Preoccupation

(as long as it lasts)

but

Paper Mill Machinery is Our Business

*

TABLE ROLLS PRESS ROLLS
MACHINE PARTS
FROM BEATERS TO CALENDERS

UNION MACHINE COMPANY

FITCHBURG, MASS.

(Associated with Union Screen Plate Company)

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Thirds and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.30	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

Pre-War Quotations

All Prices Nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.25	@	3.30
Wool Tares, light	3.25	"	3.50
Wool Tares, heavy	3.50	"	3.75
Bright Bagging	3.25	"	3.50
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Prices.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¼	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	@	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.50
No. 1 Clean bright—			
Sisal Strings	.04	"	—
No. 2 Clean bright—			
Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South American	—	"	3.25
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.65
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

* OPA Maximum Prices.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¾	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06¼
Underwear Cutters, Bleached	.06¼	"	.06¾
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03¼
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¾	"	.03½
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.06¼	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—*
Miscellaneous	3.20	"	—*
White No. 2—			
Miscellaneous	2.65	"	—*
Twos and Blues, Repacked	2.20	"	—*
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—*
Miscellaneous	1.80	"	—*
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—*
No. 2	1.45	"	—*
No. 3	1.35	"	—*
No. 4	1.35	"	—*
No. 5, Quality A	1.35	"	—*
Quality B	1.20	"	—*
Quality C	.95	"	—*
Old Manila Rope	5.75	"	—*

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—

EMBOSSING ROLLERS

Roehlen Engraving Works, Inc.

324 St. Paul St., Rochester 5, N. Y.

Mfrs. of Engraved Embossing Rollers and Plates of Any Type and Description
Worn Rollers Re-Engraved.

Complete Designing and Engineering Service

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THE HAYDEN WIRE WORKS, INC.

Manufacturers of

BRONZE and BRASS WIRE CLOTH

West Springfield, Mass.
Cylinder Covering a Specialty

MISCO "C"

THE CORROSION RESISTANT ALLOY

CAST • ROLLED • FABRICATED

for all equipment exposed to corrosion by sulphite acids

MICHIGAN STEEL CASTING CO., DETROIT 7, MICH.

Volclay

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For the Paper Manufacturer
Produced By
AMERICAN COLLOID COMPANY
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J. Andersen & Company

21 East 40th Street

NEW YORK

Importers of Pulp

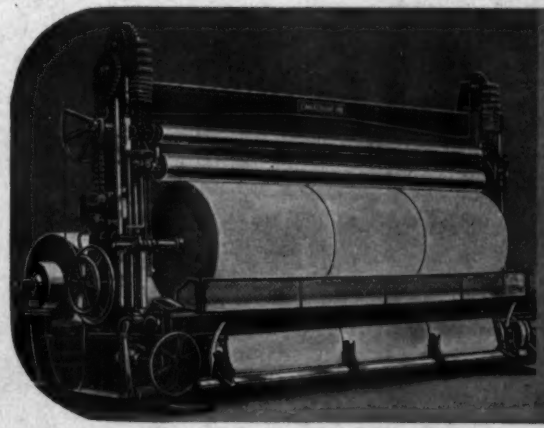
BLEACHED AND UNBLEACHED
SULPHITE, KRAFT PULP AND
GROUND WOOD

LANGSTON

Slitters and Roll Winders

Noted for reliability and accuracy under the heavy pressure of high-speed production

SAMUEL M. LANGSTON COMPANY, CAMDEN, N. J.



LARGEST CYLINDER BOARD MACHINE in the world is equipped with CAMERON 19 WINDER

CAMERON 19 Winder is built in widths up to 192". Runs at speeds up to 2800 f.p.m. on paper or 1500 f.p.m. on board. Winds rolls to diameters up to 40" on paper or 60" on board. Write for interesting folder.

CAMERON MACHINE COMPANY
61 Poplar Street Brooklyn 2, N. Y.
Midwest Office: 111 West Monroe St., Chicago 3, Ill.

HELP WANTED

WANTED IMMEDIATELY

Designing Engineers, draftsman, detailers for post war work, excellent wages, pleasant working conditions. Write or phone:

Bagley & Sewall Company
Watertown, New York

A-30

HELP WANTED

For New Mill in Mexico making nine point straw:

3 Tour Bosses
3 Machine Tenders
3 Beater Men
1 Superintendent

Address Box No. 45-462 care paper Trade Journal. A-30

A large Northeastern pulp and paper manufacturer has attractive openings for several chemists or chemical engineers with sound technical backgrounds and experience in the development aspects of the manufacture and conversion of pulp and paper. Address Box 45-465 care Paper Trade Journal. A-23

WANTED

TOUR BOSS, MACHINE TENDER, SHIPPING CLERK. Board Mill located in Northeastern Pennsylvania, making Folding Grades.

Extensive plans for expansion under way.

Excellent post-war future assured. Permanent jobs, good chances for advancement for the right men.

Only men looking for permanent connection and steady work need apply. Box 45-411 care Paper Trade Journal. A-23

PAPER BAG ADJUSTORS

Flat and Square, Specialty Bags, Aniline Printing. Excellent opportunity for steady, well-paying future. Plant located in South. Write full details. Confidential. Box No. 45-478 care Paper Trade Journal. A-30

Paper Bag Machine ADJUSTORS

Flat, Square, Shipping Sacks or Self-Opening. Top wage rates, rapid advancement, good future for experienced man. Write, giving full details. Our employees know of this ad. Location, New York City, Box No. 45-477 care Paper Trade Journal. A-30

HELP WANTED

CHARLES P. RAYMOND SERVICE INC.
294 Washington St., Boston, Mass.
Specializing in Paper Mill Personnel
Positions Now Open

Plant engineers $250-400 month
Engineer exp. design of paper, pulp and board mills
Mechanical structural and electrical engineers
Container board mill superintendent
Tour boss, beater engineer board mill
Master mechanic and steam engineer board mill
Mgr. molded pulp manufacturing
And many others

We invite correspondence (strictly confidential) with employers seeking personnel and men seeking new positions. A-23

Development Chemist for Converting Plant located in the New York Metropolitan Area.

List all information in first letter and interview will be arranged promptly. Address Box 45-488 c/o Paper Trade Journal. S-6

CLASSIFIED ADVERTISING

HELP WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.

SITUATIONS WANTED—5c a word, double rate for heavy face type. Minimum charge $1.25. If repeated ½ rate will be charged for each consecutive repetition.

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If box number is used—35 cents additional.

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PAPER TRADE JOURNAL
15 West 47th Street
New York 19, N. Y.

HELP WANTED

SALARIED POSITIONS $2,500-$25,000. Post-war plans are creating lifetime opportunities now. This thoroughly organized confidential service of 35 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated, through a procedure individualized to each client's requirements. Several weeks are required to negotiate and each individual must finance the cost of his own campaign. Retaining fee protected by refund provision. Identity covered and present position proteoted. Plan now for post-war security. Send only name and address for details. R. W. BIXBY, INC., 117 Delward Bldg., Buffalo 2, N. Y. TF

WANTED—CHIEF CHEMIST for pulp and paper mill located on Pacific Coast. Apply in own handwriting giving references, experience and other pertinent information. Address Box 45-243 care Paper Trade Journal. TF

MACHINE TENDER for cylinder machine operations. Must be experienced at this particular kind of machine operations. Prefer high school graduate or equivalent. Address Box 45-293 care Paper Trade Journal. TF

WANTED—Two Paper Sheet Cutter Machine Operators for Book and Specialty Mill. Address Box 45-440 care Paper Trade Journal. A-23

TOUR BOSS wanted for mill in South America. Must have experience on cylinder and fourdrinier machines making tissue, faced boards, corrugating medium and liners. Address Box 45-452 care Paper Trade Journal. A-23

CHEMICAL Company in metropolitan New York area has opening for a chemist familiar with the problems of paper coatings and finishes involving resins. Address Box 45-460 care Paper Trade Journal. A-30

WANTED — ENGINEERS — Capable of handling general engineering work in established consulting engineers office specializing in pulp and paper mills. Address Box 45-469 care Paper Trade Journal. TF

PLANT ENGINEER with long experience in construction and maintenance of pulp and paper mills and operation of Electro-chemical and Power Plants. Address Box 45-483 care Paper Trade Journal. A-30

TOUR BOSSES wanted for Roofing Felt Mills located in New Orleans and Metropolitan New York Area. Send complete resume giving experience, etc. to Box 45-491 care Paper Trade Journal. S-6

SALESMAN—Experienced folding cartons and boxboard specialties. Unusual opportunity in protected territory. In reply give complete resume of experience and personal status. Reply held in strictest confidences. Address Box 45-501 care Paper Trade Journal. A-30

SALES ENGINEER—Age 25-35. Preferably training pulp and paper industry. Willing travel. Good opportunity reliable firm. Address Box 45-492 care Paper Trade Journal. A-30

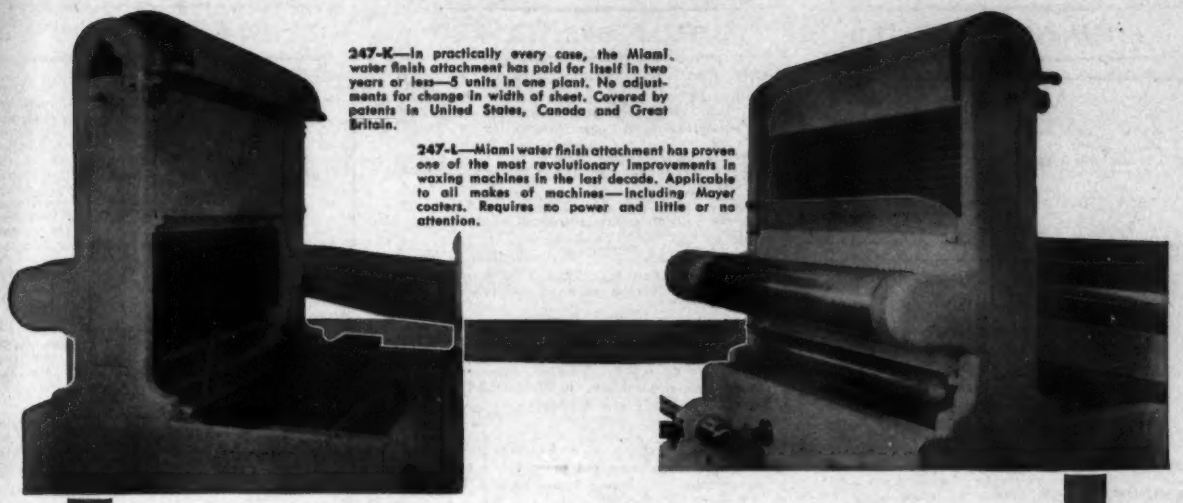
WANTED—Capable man with qualifications to take over operation of board mill as assistant superintendent with good prospects of being promoted to superintendent. This is a rare opportunity. Mill is located in Middle East. Address Box 45-497 care Paper Trade Journal. TF

WANTED—Experienced adjuster and machine tender for Lockport and National Paper Bag Machines, for flat and square bags. Plant in western New York. Address Box 45-498 care Paper Trade Journal. S-20

SALES MANAGER—Well established house in Philadelphia, Pa. wants man with paper experience and car to sell paper specialties to restaurants, hotels, institutions, luncheonettes, etc. Address Box 45-503 care Paper Trade Journal. S-13

CHEMIST—Paper Mill. Whiting Paper Company, Holyoke, Mass. A-30

WANTED—3 Experienced Paper Mill Millwrights for Mill in Western U. S. Address Box 45-502 care Paper Trade Journal. S-13



247-K—In practically every case, the Miami water finish attachment has paid for itself in two years or less—5 units in one plant. No adjustments for change in width of sheet. Covered by patents in United States, Canada and Great Britain.

247-L—Miami water finish attachment has proven one of the most revolutionary improvements in waxing machines in the last decade. Applicable to all makes of machines—including Mayer coaters. Requires no power and little or no attention.

INTERESTED?

247-N—A special Waxer for regular grades of wax paper, as well as wax laminating. Two top rolls micrometer adjusted individually. This machine with electric drive, operates at 1,200 F.P.M.

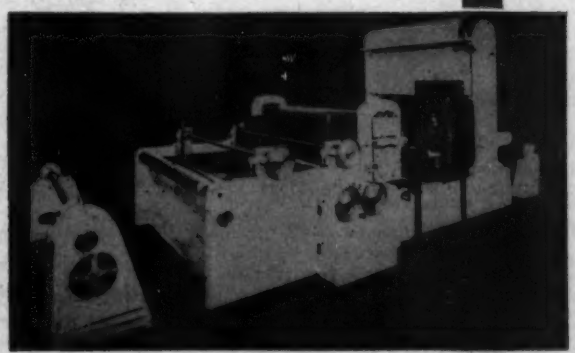
Nothing developed by Black-Clawson, Shartle, Dilts in forty years of operation ever caught on faster than the Miami Waxing Machine and Water Finisher line.

Anticipating a rather restricted market, we were surprised to learn that we had tapped a much greater market—and a most receptive one. In consequence many sales and many installations have been made, and a lot of waxers and water finishers are still on order. Miami Waxing Machines and water finish attachments appeal because they represent a tremendous step forward.

Correct mechanically. Operates perfectly. Will pay for itself in comparatively short time. Clean cut and modern in appearance. Miles ahead of anything ever before designed for the purpose.

There is a whale of a story to tell interested parties and there are plenty of installations you can visit.

247-C—Special breadwrap machine with auxiliary cooling roll on water finish attachment. Note clean cut appearance of operating side. Four years' continuous operation attest to its mechanical features.



247-3—Pneumatically loaded rolls bring accurate control to the Lo-Type waxer. Recorded loading and roll setting insure duplicate runs at later date, quicker and easier threading.

BLACK-CLAWSON COMPANY, HAMILTON, OHIO

Divisions: Shartle Bros., Middletown, Ohio; Dilts Machine Works, Fulton, N. Y.
Associate: Alexander Flock, Limited, Ottawa, Canada

SITUATIONS WANTED

CUTTERMAN with years of experience in a supervisory capacity, wishes a position with a good papermill. Can handle any sheet cutter and take charge of any sheet cutting department. Has a general knowledge of finishing room work.

Address Box 45-487 Paper Trade Journal
A-30

FINISHING & SHIPPING CONSULTANT

If you are interested in increased output, lower costs per ton, reduced waste, and greater efficiency in your finishing and shipping department I can help you. Results positively guaranteed. Nominal fee. Address Box 45-479 care Paper Trade Journal.
A-30

FOREMAN FINISHER or Converting Plant Supervision—Years diversified experience, Tissue, Wrapping, Bond, Envelope, Waxed Papers, etc., proficient operator instructor, Sheeting, Winding, Trimmer, Scheduling, Shipping, Warehousing etc. Address Box 45-441 care Paper Trade Journal.
A-23

SUPERINTENDENT—20 years experience in paper bag conversion of grocery, sacks and aniline or oil ink specialty bags. Capable of handling all bag shop problems. Thorough experience in supervision of help, maintenance and repairing of machines. Address Box 45-450 care Paper Trade Journal.
A-30

BEATERROOM SUPERINTENDENT or foreman. 55 years old. 35 years theoretical and practical experience on most kinds of paper. Good on color. Address Box 45-484 care Paper Trade Journal.
A-30

SITUATIONS WANTED

CHEMICAL EXECUTIVE AND CONSULTANT wishes to contact parties interested in manufacturing cigarette and other tissue papers. Address Box 45-493 care Paper Trade Journal.
A-23

WOOD PULP SALESMAN well acquainted with officials and purchasing agents in Middle West, would appreciate interview. Address Box 45-496 care Paper Trade Journal.
S-13

SUPERINTENDENT desires change. Experienced on tissues, kraft papers, news, etc. Address Box 45-495 care Paper Trade Journal.
S-6

CHIEF CHEMIST—Assistant Manager. Research and development for pulp, cigarette, carbon and fine papers. 10 years experience, supervision and production. Available. Address Box 45-494 care Paper Trade Journal.
A-23

CHIEF CHEMIST with wide experience in southern kraft pulp and paper mills, desires a position as technical director or assistant manager with a progressive firm. Address Box 45-504 care Paper Trade Journal.
S-6

PAPER MILL & PAPER CONVERTING EQUIPMENT FOR SALE

34" Inman Slitter.
42" Finishing Cloth Slitter.
36" Sheridan Automatic Power Paper Cutter.
44" Seybold Holyoke Art. mill type Power Cutter.
45" White Automatic Power Cutter.
60" Finley Sheeter.
110" Hamblet heavy duty Sheeter.
60" Rice Barton & Fales Slitter & Rewinder, for use on dry end of paper machines.
120" Moore & White 4-drum Rewinder.
New 62" Two-Roll Bank Stand, handling rolls up to 30" diameter.
4 Waldron 36" Paper Reelers
Baling Machines, both hand and power.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18, N. Y.
TF

FOR SALE

FOR SALE
New and guaranteed used steel pipe, boiler tubing, valves, fittings, wood and steel tanks, steel buildings
106. GREENSPON'S SON PIPE CORP. NATIONAL STOCK YARDS, Illinois.
B-4

FOR SALE—One No. 97 Davidson suction feeder with ¼ H.P.D.C. Motor. Perfect condition. Bargain. Address Box 45-456 care Paper Trade Journal.
A-30

FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24". Also Triple-Deck Frames for ninety 36" dryers, any width. The Chesapeake Paperboard Co., Baltimore, 30, Md.
TF

PAPER COATING MACHINERY — Waxing, Oiling, Gumming, Gluing, Carbon, Laboratory Coating and Treating Machines. High speed. New improvement. MAYER MACHINE COMPANY, Inc., 1155 Scottsville Road, Rochester, 11, N. Y.
TF

FOR SALE—Knowlton 16" Convolute Can Winder with Labeling attachment—Langston Paper Roll Slitter Drum Rewind, Paper Core and Tube Recutter. THEO ADAMS, 111 W. Washington Street, Chicago 2, Ill.
A-23

FOR SALE—Complete Pulp and Paper Mill. Earning fine profit. Excellent condition. Information given to principles only. Address Box 45-489 care Paper Trade Journal.
S-6

FOR SALE—6—Oliver BRAND NEW 8' x 6' Rotary Filters or Dewaterers; Valley Iron Works 100 lb. Beater; Robinson 30" Refiner with 2—40 HP AC motors; Krupp Beater Mill or Pulp Disintegrator, with 40 HP AC motor. WANTED: EVAPORATORS, DRYERS, FILTERS. BRILL EQUIPMENT COMPANY, 225 West 34th Street, New York 1, N. Y.
A-30

FOR SALE—PUMPS

CENTRIFUGAL PUMPS

Ref. No.

37. 1—Allen—4" —350 g.p.m. —40' head — motor base—no motor.

39. 1—Twinvolute—3"—300 g.p.m. — 40' head—motor base—no motor.

65. 1—Lawrence Machine Co. — 4" — 430 g.p.m.—23' head—motor base—no motor.

91. 1—Penn Pump Co.—150 g.p.m.—25' head—motor base—no motor.

128. 1—Worthington—220 g.p.m.—60' head.

129. 1—Foster-Wheeler Corp.—375 g.p.m.—65' head.

135. 1—Foster-Wheeler Corp.—200 g.p.m.—65' head.

137. 1—Taber Pump Co.—160 g.p.m.—30' head.

140. 1—DeLaval—200 g.p.m.—25' head.

142. 1—Worthington—400 g.p.m.—27½' head.

142A. 1—Worthington — 400 g.p.m. — 27½' head.

143. 1—Warren Steam Pump Co.—300 g.p.m. —40' head.

156. 1—Dayton-Dowd Co.—200 g.p.m.—50' head.

160. 1—Deming—160 g.p.m.—30' head.

168. 1—Worthington—330 g.p.m.—70' head.

172. 1—Goulds—600 g.p.m.—50' head.

177. 1—DeLaval—850 g.p.m.—370' head.

182. 1—Earle Gear & Machine Co.—140 g.p.m.—40' head.

184. 1—Novo Engine Company—125 g.p.m. —30' head.

186. 1—Fairbanks Morse—500 g.p.m.—25' head.

189. 1—Worthington—4500 g.p.m.—33' head.

190. 1—DeLaval—5555 g.p.m.—170' head.

201. 1—Fairbanks Morse—900 g.p.m.—76' head.

206. 1—Goulds—200 g.p.m.—150' head.

207. 1—Frederick Iron & Steel—200 g.p.m. —80' head.

208. 1—Allis Chalmers—250 g.p.m.—45' head.

216. 1—Allis Chalmers—130 g.p.m.—50' head.

217. 1—DeLaval—2200 g.p.m.—150' head.

218. 1—Worthington—250 g.p.m.—75' head.

228. 1—Buffalo 5500 g.p.m.—50' head—direct connected to 100 h.p. motor.

DUPLEX PLUNGER STOCK PUMP

1—10 x 20 Duplex (Shartle).

STOCK PUMPS

1—Keystone Driller Co.—450 g.p.m.—50' head (Reference 64).

1—Morris Machine Works—3 x 4 (Reference 114).

1—Frederick Iron & Steel Co.—open impeller—275 g.p.m.—50' head (Reference 144).

1—Union—Belt Driven—6 x 8 (Reference 222).

1—Smith & Winchester—Belt Driven—5 x 7 (Reference 225).

1—Fairbanks Morse—Belt Driven—5 x 5 (Reference 227).

1—Lawrence—10". (230)

Various other sizes

TRIPLEX PLUNGER STOCK PUMPS

1—Moore & White 10 x 12 Triplex Stock Pump.

Complete details regarding any of the above pumps furnished on request.
Write us regarding your particular requirements for Pumps if not listed above.

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Ross Paper Machinery Co., 17 Porter Ave., Newark 8, New Jersey, Waverly 3-5675

146" Pulp Drying Machine—200 ton per day drying capacity.

Prints and additional information on request.

BEATERS
1—2500 lb. Downingtown Iron Tub
1—750 lb. Downingtown Iron Tub
2—1000 lb. Horne Iron Tub
1—1200 lb. Holyoke Wood Tub

CALENDER STACKS
1—9 Roll Lobdell 124" Warren Doctors
1—10 Roll Farrell 104" Warren Doctors
1—11 Roll Pusey & Jones 104" Warren Doctors

CONVERTING EQUIPMENT
1—Bliss Double Head Stitcher
1—Bliss Single Head Stitcher
1—Bliss Box Assembling Machine
1—66" Dietz Towel Winder
4—Waterville Grinders
1—42" Parry Liner & Combiner
1—36" Waldron Reeling Machine
1—39" Dampening Machine
1—36" Brush Coating Machine
1—Copper Mixing Tank with agitator—40 gal.
1—Cast Iron Kettle 20" x 24" 2 outlets

DRYERS
5—48" diam.—102" face—2 deck frames.
40—36" diam. 86" face 3 deck frames
18—36" diam. 82" face 2 deck frames
40—28" diam. 96" face 2 deck frames

FESTOON DRYERS
100" Proctor & Schwartz
60" Proctor & Schwartz

FLAT SCREENS
1—Moore & White 8 Plate
1—Moore & White 10 Plate
1—Sandy Hill Packer 10 Plate
1—Trimbey Pulp Screen 30 ton cap.

JORDANS
1—E. D. Jones Standard motor drive
1—Dillon No. 2 Motor drive
1—Appleton No. 2 motor drive
1—Noble & Wood Monarch Belt Drive
1—Emerson No. 2 Belt Drive

KNIFE GRINDER
1—72" Seybold automatic used one year

MISCELLANEOUS
1—Warren Broke Target with pump
2—Yankee Dryer doctor oscillators (Beloit)
2—Nugent Oil Filters (new)
2—Beloit Fourdrinier Shakes
1—Oster Pipe Threading Machine 2" to 6" direct conn. to motor

MOTORS
1—30 h.p. 600 R.P.M. 2300 V. 3 Ph. 60 cy.
1—40 H.P. 3600 R.P.M. 2300 V. 3 Ph. 60 cy.

PLATERS
2—Holyoke 2 Roll 18" dia. 36" face

PULP EQUIPMENT
2—Pusey & Jones vertical Digesters (welded) 7' dia., 24' high 125 lb. pressure
8—Horizontal Digesters 15' diam. 47' face 150 lb. pressure
3—Improved No. 2 Knotters
1—Nichols-Herreshoff Lime Kiln
1—Williams No. 30 Bark Hog
1—Sumner Disc Barker 72" dia.

PULPERS
1—Sturtevant Bale Pulper with conveyor & motors
1—Volth Pulper No. 1-20 tons cap.

PUMPS
1—Pusey & Jones 5" x 8" Stock.
1—DeLaval 6" x 6"
1—Oliziti Acid 3" Suction.
1—Frederick 600 g.p.m. 50' head (stock)
1—Midwest 6" stock pump

REELS
2—Pusey & Jones 104" face 18" dia. bowls
1—Pusey & Jones 115" face 18" dia. bowls
1—2-bowl 100" face 20" dia. bowls

SATURATOR
1—Guyton-Cumfer 5 gates

SAVEALL
1—A. D. Wood cylinder 48" dia. 60" face
1—No. 4 Bird with motor and speed reducer 15" diam. rubber couch.

SHEETER
1—100" Hamblet Duplex with Reeves Drive

SLITTERS & WINDERS
1—104" Warren two drum.
1—72" Pusey & Jones two drum.

SPEED REDUCERS
1—Philadelphia ratio 60 to 1—5 H.P.
1—Philadelphia ratio 600 to 1—2 H.P.
2—Grant ratio 7 to 1 5 H. P.
1—Oliver ratio 51 to 5.1 5 H.P.
1—Cleveland ratio 47 to 1 23 H.P.

STUFF PUMPS
1—12" x 12" Goulds triplex
8—10" x 20" Shartle triplex
1—8" x 18" Shartle triplex
1—12" x 16" Shartle triplex
1—8" x 10" Shartle triplex
1—7" x 16" Shartle duplex
1—8" x 18" Shartle duplex

SUCTION FELT ROLLS
1—Downingtown 12" diam. 106" drilled face
1—Downingtown 10" diam. 106" drilled face

VACUUM PUMPS
1—14" x 20" Connersville
1—12" x 18" Connersville

WASHERS (Beaters)
1—54" face—45" diam. with rigging
1—52" face—52" diam. with rigging

WET MACHINE
1—84" Improved three roll Hydraulic Enclosed drive (used one year)

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One large Breaker Beater complete
One small Beater Complete
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1—New pair cast steel double suspension spring type beater bearings for 9" diameter journal—Noble & Wood beater roll. Never used.
1—Used old style lighter beam for 9" diameter journal Noble & Wood beater
1—New reinforced design lighter beam for 9" diameter journal—Noble & Wood beater roll. Pattern No. 663. Never used.
3—300 KVA —23000-2300/4000 volts transformers
1—250 H.P. slip ring motors & controls—450 R.P.M.—3 bearing base and pulley
60—32" Face steel dryer felt rolls—1—7/16" journals
1—30" Face cast iron taper pulley—2 15/16" bore taper 31"x29½"
4—32" diameter x 82" face dryers
1—6" to 10" Cox & Sons Pipe threading machine
1—48"x48" Noble & Wood beater roll with filling installed
1—40" Noble & Wood impeller for circulation stock in beater.

A visit to the mill would prove profitable as we have many items for sale to numerous to mention. See our superintendent Mr. O. P. Fussell at our plant in Walloomsac, New York.

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Mills: Walloomsac, New York
Main Office: 25 Vanderbilt Avenue
New York 17, New York TF

FOR SALE—64" Seybold Twentieth Century Cutter, guaranteed to be in good working order. Address Box 45-499 care Paper Trade Journal. A-23

FOR SALE

1—Standard Horne Jordan with new shell and plug fillings.
1—300 lb. Valley Iron Works high speed Beater of the Holland type. A-1 condition.
1—Knowlton Spiral Core Machine complete with 36" Langston Rewinder. Immediate delivery.
1—7-roll 40" wide Holyoke Super Calender Stack, complete with 50 H.P. G. E. a.c. 3 phase 60 cycle, 220 volt motor equipment. Machine in perfect condition.
1—84" Left Hand 4 Knife Carthage Chipper with two new sets of knives.
1—36" Camachine 44W Low Model Roll Rewinder. Complete and in good condition.
1—22 Lamoyo Pulper complete with 40 H/P A.C. motor equipment. A-1 condition.
1—110" Double-Drum Waldron late type shear cut hydraulic Slitter and Rewinder.
1—Type FC International Folding Paper Box Machine Co.'s Folding and Gluing Machine. Range of sizes on folded cartons 2¾" to 10" when folded flat and 2" to 30" long.
1—30" Standard Waldron Embossing Machine with Levant pattern.
1—20" wide Paper Converting Co.'s machine for automatically winding rolls of decorated crepe tissue paper.
1—10" x 32" Standard Sheridan Die Press with motor. Rebuilt and guaranteed.

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A-30

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FOR SALE

FOR SALE

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1—Shartle Bros. Decker 36" diameter x 60" face including couch roll.
1—120" Fourdrinier Wet End.
1—#9 Emerson Jordan for direct connection to a motor, requires use of 400 H.P. motor.
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1—Moore & White 10 x 12 Triplex Stock Pump.
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1—1000 lb. Dayton Beater.
1—Jones pulper — direct connected to 60 H.P. motor.
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1—81" Dietz Toilet Converter.

Various sizes of Centrifugal Pumps. Write us regarding your particular requirements.

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WANTED—1—36" Diameter x 90" to 93" Face Cylinder Mold. Address Box 45-461 care Paper Trade Journal. A-30

WANTED—Fourdrinier Paper Machine, 30 ton daily capacity, trim 80". Address Box 45-476 care Paper Trade Journal. A-23

WANTED—One Rag Cutter, in good condition. Hawley Products Canada Ltd., Brantford, Ontario, Canada. S-6

WANTED—Brightwood Box Machine. Address Box 44-836 care Paper Trade Journal. tf

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 44-835 care Paper Trade Journal. tf

WANTED—Spiral Paper Tube Winder and Tube Recutter and Roll Paper Slitter and Rewinder. Address Box 45-472 care Paper Trade Journal. A-23

WANTED—Heavy Triple Deck Frames for seventy 36" Dryers. In reply give full particulars as to condition, make and price. Sangamon Paper Mills, 3915 South La Salle Street, Chicago 9, Ill. A-23

WANTED—Two 12 plate flat screens complete with scraper and plates. Sangamon Paper Mills, 3915 S. La Salle St., Chicago 9, Ill. A-23

WANTED

DESIRE GOOD USED SUPERCALENDER with 108" to 112" face. Complete if possible with electric drive. Will purchase outright or trade 70" supercalender complete. Good operating condition. Give full particulars in first letter. Address Box 45-490 care Paper Trade Journal. A-23

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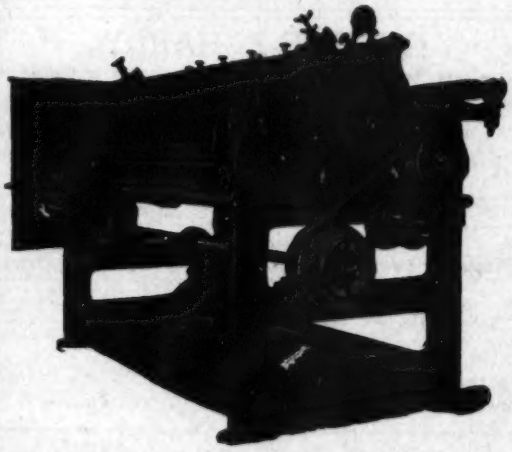

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Graton & Knight Company
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
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United States Rubber Co.
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Niagara Alkali Co.
Noble & Wood Machine Co.
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Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
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De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross J. O. Eng. Co.
Shartle Brothers Machine Co.

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American Resinous Chemicals Corp.
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Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Stauffer Chemical Company
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemicals Corp.

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Bird Machine Co.
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Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Nichols Engrg. & Research Corp.
Oakite Products, Inc.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp.
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Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
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Valley Iron Works Co.
T. B. Wood's Sons Company

COATERS
Horton Mfg. Co.

COATING MACHINERY
Hudson Sharp Machine Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machinery Corp.

CONSTRUCTION ENGINEERS
Merritt-Chapman & Scott Corp.

CONSULTING ENGINEERS
W. H. L. D. Betz
Frederic C. Clark
Ferguson, Hardy S.
Hardy, George F.
Johnson & Wierk, Inc.
The Kohler System Company
Main, Inc., Chas. T.
J. E. Sirrine & Co.
Stone & Webster Engrg. Corp.

CONTROLS
The Bristol Company

CONVEYORS
Black-Clawson Company
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

CORES
Elizman Paper Co.
Senoco Products Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Walker-Goulard-Plehn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
The Frederick Iron & Steel
E. D. Jones & Sons Co.
Lovejoy Flexible Coupling Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Corporation
T. B. Wood's Sons Company

CUTTERS
Thomas W. Hall Co.
Noble & Wood Mach. Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DE-INKING
Kinsley Chemical Co.

DIGESTERS
H. K. Porter Company Inc.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers
United States Rubber Co.
Westinghouse Electric Corporation

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, J. O. Engineering Corp.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric Corporation

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Fibre Making Processes, Inc.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EQUIPMENT INSTALLATION
Merritt-Chapman & Scott Corp.

EVAPORATORS
Black-Clawson Company
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg Co.
Swenson Evaporator Co., Div. of Whiting Corp.
Traylor Engineering & Mfg. Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Builders-Providence, Inc.
Merrick Scale Mfg. Co.
Leeds & Northrup
Traylor Engineering Co.
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co. Inc.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Woodward, Baldwin & Co.

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
American Resinous Chemicals Corp.
W. H. Loomis Talc Corp.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Moore & White Co.
J. O. Ross Engrg. Corp.
Worthington Pump & Mchy. Corp.
Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
Fibre Making Processes, Inc.
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Valley Iron Works Co.
Worthington Pump & Mchy Corp.

HOISTS
Appleton Machine Co.
Dilts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

INSTRUMENTS, TESTING AND MEASURING
W. H. & L. D. Betz
N. P. Bowsher
The Bristol Company
Builders-Providence, Inc.
The Foxboro Company
General Electric
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taber Instrument Corp.
Taylor Instrument Cos.
Wallace & Tiernan Co., Inc.

JORDAN FILLINGS
Appleton Machine Co.
Behr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co.
Valley Iron Works Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
W. H. & L. D. Betz
Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Valley Iron Works Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

LUBRICATORS
Hills-McCanna Co.

MICROMETERS & CALIPERS
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Montague Machine Co.

Lobdell Car Wheel Co.
Walker-Goulard-Plehn Co.

MIXERS
H. K. Porter Company
Youngstown Welding & Engrg. Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corporation

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPERMILL BUILDERS
Merritt Chapman & Scott Corp.

PAPER TUBE MACHINERY
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
Black-Clawson Company
Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

PLATERS
Perkins & Son, Inc., B. F.

PLATES
Black-Clawson Company
Hendrick Mfg. Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer G.

PUG MILLS
Traylor Engineering & Mfg. Co.

PULPS
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Elof Hansson, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Hills-McCanna Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimby Pump Co. Div. of H. K. Porter Company, Inc.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company
Worthington Pump & Machinery Corp.

RECOVERY SYSTEMS
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp. J. O.
Valley Iron Works Co.

RECTANGULAR BINS
Traylor Engineering & Mfg. Co.

REELS
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric Corporation

RESINS
American Cyanamid & Chemical Corp.
American Resinous Chemicals Corp.
The Resinous Products & Chemical Co.

ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
Roehlen Engraving Co.
J. J. Ross Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Youngstown Welding & Engrg. Co.

ROLL STANDS
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

ROTARY KILNS
Traylor Engineering & Mfg. Co.

SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

SCALES
Builders-Providence, Inc.
Merrick Scale Mfg. Co.

SCREEN PLATES
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.

SCRUBBERS
Traylor Engineering & Mfg. Co.

SHEET MACHINES
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.

SIZING
American Cyanamid & Chemical Co.
American Resinous Chemicals Corp.
Black-Clawson Company
The Dow Chemical Co.
du Pont, E. I., de Nemours & Co
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Pioneer Salt Company
Socony-Vacuum Co.
Philadelphia Quartz Co.

SLITTERS
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Johnstone Eng. & Machine Co.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SPRAY NOZZLES
The Spray Engineering Co.

STAINLESS STEEL
Allegheny Ludlum Steel Co.
Eastern Stainless Steel Corp.
Industrial Steels, Inc.

STARCH
American Cyanamid & Chemical Corp
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

WHERE TO BUY

STEAM SPECIALTIES
Johnson Corp.
Sherrie Bros. Mch. Co.
Sutcliffe Steam Specialties Co.

STRAPPING & STRAPPING MACHINES
Acme Steel Company
The Stanley Works

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric Corp.

SULPHUR
American Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

TALC
American Cyanamid & Chemical Corp.
W. H. Loomis Talc Corp.
International Talc Company

TANKS
Frederick Mfg. Co.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
H. K. Porter Company Inc.
Rodney Hunt
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

THICKENERS, DECKERS & SAVEALLS
Bird Machine Company
Bulkley, Dunton Pulp Co. Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

TITANIUM
E. I. Du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

TOOLS
Acme Steel Company
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

TRUCKS
Automatic Transportation Co.
Elwell Parker Electric Co.
Wright-Hibbard Ind. Elec. Truck Co.

TRAPS
Armstrong Machine Works
Crane Co.
Grinnel Company
Johnson Corporation
Shartle Bros. Mch. Co.

TUBS
Rodney Hunt Machine Co.
Noble & Wood Machine Co.
Shartle Brothers
Valley Iron Works Co.

TURBINES
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric Corp.
Worthington Pump & Machinery Corp.

USED EQUIPMENT
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Shartle Brothers Machine Co.

VALVES
The Bristol Company
Crane Company
Dilts Machine Works
Fibre Making Processes, Inc.
The Foxboro Company
Hills-McCanna Co.
E. D. Jones & Sons Co.
Kennedy Valve Mfg. Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Permutit Company
William Powell Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

VATS & VAT PARTS
Union Machine Co.
Union Screen Plate Co.

WASHERS
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

WATER CONDITIONING
The Permutit Company

WAXING MACHINERY
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman O.

WELDING EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Company
Walworth Company
Westinghouse Electric Corp.

WET MACHINES
Black-Clawson Co.
Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

WINDERS AND REWINDERS
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co.
Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
Johnstone Eng. & Machine Co.
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

WIRES
Appleton Wire Works
Black-Clawson Company
Bulkley, Dunton Pulp Co. Inc.
Cheney Bigelow Wire Works
Hayden Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Shartle Brothers Machine Co.

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THERE'S MORE THAN MEETS THE EYE

Only a small portion of an iceberg is floating above the surface, visible to the naked eye.

Similarly only a part of the complex and well-integrated activities of Bulkley, Dunton are actually evident to a casual observer. Complementing and supporting the salesman and the technical consultant, who are in direct contact with the market, there is a large staff of research men, market analysts, statisticians, traffic men and other skilled specialists whose manifold duties form an essential part of our century-old service to the pulp and paper industry.

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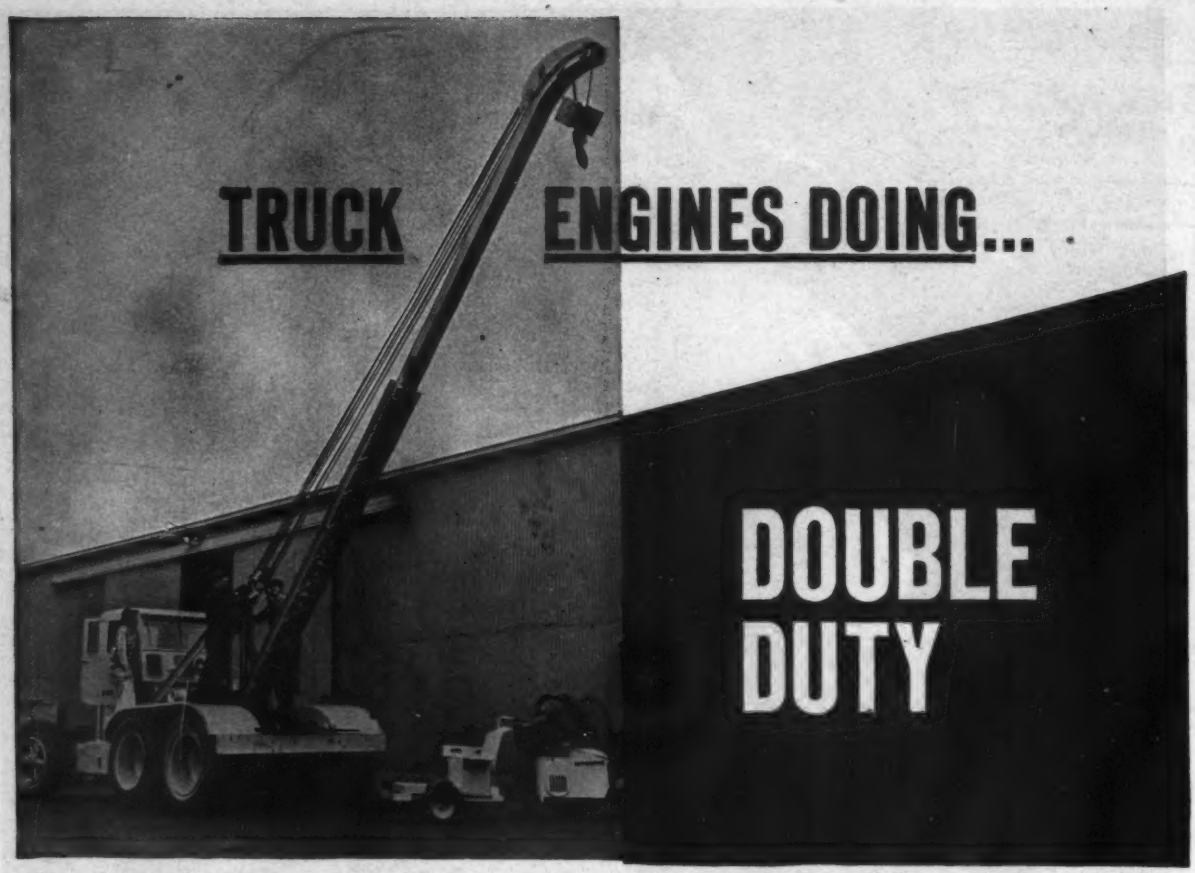

EXTREMELY useful wherever frequent lifting of heavy objects is required, this truck-mounted, ten-wheel "Dinosaur" crane has an engine which does double duty — providing power for the truck as well as the crane.

Today, almost every truck engine is doing double duty because of heavier loads and the frequent necessity for using one truck in place of two. Experienced operators know they can get uninterrupted, full-power performance from these overworked engines only by lubricating them effectively. That is why they use Texaco.

Texaco D-303 Motor Oil, for example, has the properties of detergency and dispersion. Detergency keeps piston rings and engine parts clean. Dispersion holds deposit-forming materials in suspension until drained. *D-303* protects modern bearings and prevents scuffing of rings, pistons and cylinders.

For quieter-running, longer-lasting transmission and differential gears, use Texaco transmission and differential lubricants.

Texaco lubricants have proved so effective in service they are definitely preferred in many fields, a few of which are listed at the right.

Texaco Lubrication Engineering Service is available through more than 2300 Texaco distributing plants in the 48 States. Get in touch with the nearest one, or write:

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